

REPORT ON THE INVESTIGATION  
OF SUBSURFACE PETROLEUM CONTAMINATION  
SPECIALTY PAPERBOARD  
BRATTLEBORO, VERMONT

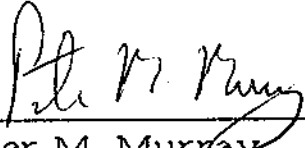
July, 1990

Prepared for:

Specialty Paperboard  
Brattleboro, Vermont

Prepared by:

Griffin International, Inc.  
2B Dorset Lane  
Williston, Vermont  
(802) 879-8800

  
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Peter M. Murray  
Project Hydrogeologist

## TABLE OF CONTENTS

1.0 INTRODUCTION	Page 1
2.0 SITE BACKGROUND	Page 1
2.1 Site Description	
2.2 Site History	
3.0 INVESTIGATIVE PROCEDURES	Page 4
3.1 Monitoring Well Installation and Soil Sampling	
3.2 Groundwater Flow Direction and Gradient Determination	
3.3 Groundwater Sampling and Analysis	
4.0 CONCLUSIONS	Page 10
Figure 1. Geologic Cross Section	
Figure 2. Treatment System Cross Sectional Diagram	
5.0 RECOMMENDATIONS	Page 12
APPENDIX A: Site Maps	
APPENDIX B: Well Logs	
APPENDIX C: Laboratory Results	

## 1.0 INTRODUCTION

This report details the investigation of subsurface petroleum contamination at the Specialty Paperboard Mill, in Brattleboro, Vermont. The investigation was conducted by Griffin International, Inc. for Specialty Paperboard. The investigation was initially conducted to determine the extent of subsurface petroleum contamination in the vicinity of two underground #6 oil storage tanks at the Brattleboro facility. During the course of this investigation, the objectives were expanded to include the determination of the extent and possible sources of chlorinated compounds, BTEX and MTBE which have been detected in the groundwater.

## 2.0 SITE BACKGROUND

### 2.1 Site Description

The Specialty Paperboard Mill is located in Brattleboro, Vermont, on the west bank of the Connecticut River, approximately 2.25 miles north of the downtown business district (see Site Location Map, in Appendix A). The mill is situated approximately 320 feet west of the river on a broad terrace which is normally 70 feet above river level. Land uses in the immediate vicinity of the mill consist of a mixture of industrial and commercial activities.

According to the Surficial Geologic Map of Vermont, the unconsolidated deposits beneath the mill consist of fluvial sands deposited in the Connecticut Valley Lake following the retreat of the continental glacier. The lake occupied what is now the Connecticut River Valley, and was formed by melt waters from the glacier. These melt waters carried a large sediment load which was deposited on the bottom of the lake in the form of a prograding delta. Once all the ice had melted, the land elevation began to rebound to its present level. As the lake level rose in relation to sea level, water flowing from the lake began to erode into the less resistant geologic formations, including the deltaic deposits near Brattleboro. Presently, the river channel is 70 feet below the lake bottom, in the vicinity of the paper mill.

This investigation has been conducted in response to a leak from one of two 25,000 gallon underground storage tanks which were used to store #6 oil for the mill's main boilers. The #6 oil has

contaminated these deltaic deposits in the vicinity of the tanks. The tanks were located on the east side of the plant building, near the door to the machine shop (see the Site Map in Appendix A for location of the tanks). Presently, there are two new underground tanks, used to store #6 oil, immediately southeast of the location of the leaking tank, which has since been removed. Both the tanks and the lines which transmit oil from the tanks, to the boilers, are continuously heated so that the viscous oil can flow through the pipes to the boilers.

## 2.2 Site History

On February 1st and 2nd, 1990, Specialty Paperboard excavated and removed two 25,000 gallon underground storage tanks (shown as "OLD TANKS" on the Site Map, in Appendix A). Upon removal of the tanks, a hole was noticed near the northern end of one of the tanks. At that time, it was determined that #6 six oil had been leaking from that hole into the surrounding soil. In response to this situation, Specialty Paper Board hired Soils Engineering, Inc. to drill soil borings in the vicinity of the old tanks to determine the extent of the soil contamination. Soils Engineering drilled a total of three soil borings on February 15th and 16th. These borings are listed as MW-1, SB-1 and MW-2 on the Site Map.

MW-1 was installed near the leak in the one underground storage tank. The borehole for this well was advanced to a depth of approximately 72 feet below grade. Heavy petroleum contamination was detected in the soils retrieved from this borehole from a depth of 8 feet to a depth of 47 feet. SB-1 was drilled near the other end of the leaky tank. The borehole was advanced to a depth of 50 feet below grade. No petroleum contamination was detected in the soils retrieved from SB-1. MW-2 was drilled approximately 45 feet in the presumed downgradient direction of the leaky tank. There was no petroleum contamination detected in soils retrieved from MW-2 either. MW-1 and MW-2 are now monitoring wells. SB-1 was a soil boring which was backfilled at the completion of drilling.

From the information provided by these three boreholes, it was assumed that the highly viscous #6 oil had leaked from the heated tank and migrated downward through the soils to a depth of 47 feet. At that depth, it was assumed that the oil had lost enough

heat to make it too viscous to migrate any deeper. Since the heat source had been removed with the old tanks, it was assumed that the product would remain in the soils in a solid state, thereby resulting in the discontinuation of the migration of adsorbed contamination.

In response to this situation, the State of Vermont Department of Environmental Conservation sent a letter of notification to Specialty Paperboard on February 22nd, requiring that an additional assessment of the situation be conducted. Specifically, the DEC required that additional soil borings be drilled and an assessment be conducted to fully define the extent of the subsurface petroleum contamination and to develop plans to mitigate the contamination.

On May 3rd, Specialty Paperboard engaged Griffin International, Inc. to conduct this assessment. The original plan was to install one additional monitoring well and three additional soil borings. If significant concentrations of petroleum contamination were detected in the soil borings, Griffin was to install monitoring wells in the holes, as well. Once the wells were installed, Griffin was to collect and analyze samples from each monitoring well using EPA Methods 601, 602 and 418.1.

Drilling of these borings began on May 14th. The first hole drilled (MW-3 on the Site Map) was originally intended to be a soil boring, however, significant petroleum contamination was detected in the soils to a depth of 72 feet, requiring installation of a monitoring well in that hole. The second borehole (SB-2 on the Site Map) also contained significant amounts of contamination, but it was decided not to install a well in that hole. Soils retrieved from the third borehole, SB-3, contained no detectable petroleum contamination. Soils retrieved from the fourth borehole, MW-4, also contained no detectable petroleum contamination. A monitoring well was installed in this borehole as was originally planned.

Water samples were then collected from each of the four monitoring wells for laboratory analyses. The analyses indicated that the groundwater in the vicinity of the leaky tank contained chlorinated compounds, BTEX and MTBE, and total hydrocarbons. The data was presented to Specialty Paperboard on June 13th. At that point, Specialty Paperboard asked Griffin to resample the four monitoring wells on site, as well as three monitoring wells located on the northern end of their property, which were installed to monitor groundwater from the Windham Regional Solid Waste

Landfill. The landfill is adjacent to the Specialty Paperboard property.

### 3.0 INVESTIGATIVE PROCEDURES

#### 3.1 Monitoring Well Installation and Soil Sampling

To more adequately define the extent of subsurface petroleum contamination, Griffin International drilled a total of four soil borings in the vicinity of the leaky underground #6 oil storage tank. The borings were drilled using a hollow stem auger drill rig with six inch inner diameter augers. Split spoon samples were collected from each borehole at regular intervals. Each sample was logged by the supervising hydrogeologist and screened for hydrocarbon vapors using a photoionization device. Soil characteristics and vapor concentrations are listed on the well logs in Appendix B.

Monitoring Well #3 (MW-3 on the Site Map) was installed to determine the eastward extent of the petroleum contamination. It was originally intended to be a soil boring with no well installed; however, heavy petroleum contamination in soils retrieved from this borehole necessitated installation of a monitoring well so that water samples could be retrieved for laboratory analysis. Soils retrieved from the borehole for this well consisted of mostly fine to coarse sand with a little silt. Thick, black petroleum contamination was detected in soils retrieved from a depth of 21.5 feet to 67 feet below grade. Hydrocarbon vapor concentrations in these soils ranged up to 38 ppm. The petroleum contamination apparently extends to the water table in this hole. The borehole was advanced to a depth of 80 feet below grade so that an appropriately constructed monitoring well could be installed. The well was constructed of 20 feet of 2 inch diameter, 0.010 inch slotted PVC well screen and 59 feet of well casing. A gravel pack was placed around the well screen to prevent silts from clogging the screen. A bentonite seal was installed above the gravel pack to prevent cross contamination of the groundwater from surface runoff. The well was completed with a four inch diameter road box which was grouted in place. The well log for MW-3 illustrates the construction details.

Soil Boring #2 (SB-2 on the Site Map) was drilled to a depth of 76 feet. Split spoon samples were retrieved from this hole in five foot

intervals. The split spoon samples retrieved from this hole consisted of nearly horizontal stratigraphic sequences, each measuring approximately one foot thick. These stratigraphic sequences begin as coarse, well rounded, well sorted sand at the top and grade into fine, silty sand at the bottom. Thick, black petroleum contamination was observed in these samples beginning at a depth of 15 feet below grade and ending at 72 feet, approximately 4 feet below the water table. The contaminated soils were observed to be very warm to the touch with the warmest soil near the fifteen foot level. This heat is believed to be residual heat from the old tanks.

Near the top of the contaminated soil, the petroleum concentrations appeared to be thicker in the tops of the stratigraphic sequences, in the coarser sand, indicating that the petroleum migrates more freely through the coarser sands. Hydrocarbon vapors in these soils were measured up to 55 ppm. The borehole for SB-2 was backfilled with the drill cuttings and capped with a concrete plug.

Soil Boring #3 (SB-3 on the Site Map) was installed in a location which was assumed to be downgradient of MW-3. The borehole for SB-3 was extended to a depth of 72 feet. Split spoon samples were collected from this borehole at five and ten foot intervals. These samples also contained the same stratigraphic sequences as were observed in SB-2. The one foot sequences graded from coarse, well rounded, well sorted sand at the top to fine sand and silt at the bottom. No apparent petroleum contamination was observed in these soils.

Monitoring Well #4 (MW-4 on the Site Map) was installed as the assumed furthest downgradient well to the leaky tank. The borehole for this well was advanced to a depth of 85 feet. Split spoon samples were collected at five and ten foot intervals. These samples contained stratigraphic sequences similar to those found in SB-2 and SB-3. No apparent petroleum contamination was detected in these soils. The well was constructed of 25 feet of well screen and 58.5 feet of well casing. A gravel pack was installed around the screen and a bentonite seal was installed above the gravel pack. MW-4 was completed with a road box which was grouted in place.

### 3.2 Groundwater Flow Direction and Gradient Determination

The determination of groundwater flow direction and gradient is essential in determining both the paths and rates of migration of subsurface petroleum contamination. These determinations also help to identify any potential receptors of the contamination.

To determine both the groundwater gradient and the flow direction in the vicinity of the Specialty Paperboard Mill, the water table elevations in each well were measured relative to the tops of casings of each well. The depths to water in each well were then subtracted from the surveyed elevations of the tops of casings to obtain water table elevations across the site. The groundwater contour maps in Appendix A shows groundwater elevations, contours and flow directions. The Groundwater Contour Map for May 18th shows the groundwater flowing to the northeast at a 0.38% gradient. The Groundwater Contour Map for June 25th shows the groundwater flowing slightly more toward the north at a 0.33% gradient. The data for June 25th, 1990 suggests that the groundwater was flowing away from the Connecticut River towards the northwest at a 1.25% gradient. The flow direction in the vicinity of the old #6 oil tanks may be the result of a local area of higher water levels that extends away from the river.

The apparent direction of groundwater flow away from the river was not originally expected at the beginning of this investigation. Originally, we had assumed that the groundwater across the entire area flowed toward the river. There are many possible explanations for this occurrence. To determine the exact explanation would require a lengthy and costly investigation which would serve little immediate use. The unexpected groundwater flow direction does present different problems than had been originally expected, however. Specifically the estimate of the most likely receptors of the subsurface petroleum contamination has changed. At the beginning of this investigation, we predicted that the Connecticut River would be the primary receptor of any dissolved and free phase petroleum which may have originated from the #6 oil in the unsaturated zone. However, available data indicates that the groundwater flow is to the northwest. In addition, previous subsurface investigations conducted for the Windham Regional Landfill, indicate that the Connecticut River is a losing stream in the vicinity of the paper mill. Therefore, the potential receptor appears to be groundwater to the northwest of the paper mill.



Specifically, any water wells in that area may have the potential to collect contamination.

According to the Utilities Superintendant for the Town of Brattleboro, to his knowledge, there are only three active water wells in the immediate vicinity of the mill other than the mill's two supply wells. These wells are located at the Pepsi Bottling Plant, the Quality Inn Hotel and the Steak Out Restaurant, all three of which are located along Route 5 approximately 2,000 to 3,000 feet from the mill. At this time, there is insufficient data available to determine if these wells are receptors. All other homes and businesses in the immediate area are believed to be supplied by the Brattleboro municipal water system.

In addition to these wells, the Town has a series of backup supply wells located at the confluence of the West River and the Connecticut River, approximately 1.5 miles south of the mill. It is unlikely that contaminated groundwater could flow from the paper mill to these wells, due to the large distance it would have to travel.

The Town of Brattleboro uses a reservoir on the extreme western edge of the town as its primary water source. It is not likely that this reservoir could be affected by the petroleum contamination at the paper mill.

### 3.3 Groundwater Sampling and Analysis

On May 18th, 1990, Griffin collected samples of the groundwater from each of the four monitoring wells in the vicinity of the old tanks for laboratory analysis. These samples were analyzed using EPA Methods 601, 602 and 418.1. Results of the analyses can be found in Appendix C.

EPA Method 601 is used to quantify the concentrations of twenty-nine halocarbons, or chlorinated compounds. These compounds are not typically found in petroleum products; however, it is standard procedure for the Vermont DEC to require this analytical method to be run for water samples from a site with subsurface petroleum contamination. The lab results indicate that there were low concentrations of purgeable halocarbons in the groundwater in the vicinity of the old #6 oil tanks on May 18th. The Purgeable → ?

large area of contamination centered near MW-2. The total concentrations of the various compounds listed in the lab results ranged from 21 ppb to 75 ppb on May 18th.

EPA Method 602 is used to quantify the concentrations of purgeable aromatic compounds in water. These compounds include benzene, ethylbenzene, toluene, xylene and MTBE. These compounds are all typically found in gasoline. Benzene, toluene, ethylbenzene and xylene may be present in #6 oil in low concentrations but it is unlikely that MTBE would be present. The lab results indicate that two of the four monitoring wells did contain purgeable aromatics on May 18th. MW-4 contained 1.78 ppb toluene. MW-3 contained a total of 387 ppb total aromatics, including 16.3 ppb MTBE which is a relatively new additive to gasoline. This data indicates that the groundwater contamination in the vicinity of the old #6 oil tanks may be at least in part the result of a release of gasoline to the subsurface.

EPA Method 418.1 is used to quantify the concentrations of all hydrocarbons, natural or manmade, in water. These compounds include all petroleum hydrocarbons, some chlorinated compounds and any other naturally occurring hydrocarbons such as methane. The lab results indicate that the groundwater in the vicinity of the old #6 oil tanks contained significant concentrations of hydrocarbons on May 18th. The Total Hydrocarbons in Groundwater Map, in Appendix A, illustrates the contamination plume which was centered in the vicinity of MW-3 on May 18th. The concentrations of petroleum hydrocarbons in these wells are typical of levels found in groundwater which is in contact with free petroleum product.

These analytical results were presented to Specialty Paperboard on June 13th, at which time, they requested that Griffin resample the four, on site, monitoring wells as well as three monitoring wells on the northern end of their property. These three wells were previously installed as part of the groundwater monitoring program for the adjacent landfill. Water samples from these wells were analyzed to determine the possibility that the chlorinated compounds, which were detected in the four monitoring wells near the old tanks, were originating from the landfill. In addition to these three wells, Specialty Paperboard also requested that Griffin sample one of the two drilled wells that supply the mill with cooling and process water during the summer months.

The second round of water samples was collected on June 25th.

Groundwater samples were collected from six monitoring wells, MW 1, MW-2, MW-3, MW-5, MW-6 and MW-7, and one of the two supply wells for the paper mill. A sample was not collected from MW-3 due to the presence of free floating petroleum. Analytical results, which can be found in Appendix C, indicate that there were still low concentrations of purgeable halocarbons (chlorinated compounds) in the vicinity of the old #6 oil tanks on June 25th. MW-1, MW-2 and MW-4 all contained chlorinated compounds on that date. These concentrations are similar to the concentrations detected in the groundwater on May 18th. Additionally, there were chlorinated compounds present in two of the three monitoring wells which were installed to monitor groundwater from the Windham Landfill. MW-6 contained a total of 168.85 ppb of chlorinated compounds while MW-7 contained a total of 1.37 ppb. MW-5, which is also a monitoring well for the landfill, contained no halocarbons on June 25th. Water sampled from one of the two supply wells for the mill contained no detectable chlorinated compounds on that date.

The three landfill wells, which were sampled on June 25th, are sampled once a year by the Windham Regional Solid Waste District as part of its compliance program required by the State of Vermont Solid Waste Management Division. The most recent sampling date for that program was September 22, 1989. Analytical results for samples collected from these wells on that date indicate that groundwater in MW-5 contained a total of 19 ppb chlorinated compounds while MW-6 contained a total of 68 ppb. The chlorinated compounds detected in these wells on that date are consistent with the compounds detected in the samples collected on June 25th from these wells. MW-7 contained no detectable chlorinated compounds on that date.

In addition to being analyzed for chlorinated compounds, the water samples collected on June 25th were also analyzed for BTEX and MTBE, using EPA Method 602, and for total hydrocarbons, using EPA Method 418.1. Results of these analyses indicate that MW-6 contained 11.80 ppb benzene and 1.84 ppb toluene. Additionally, MW-7 contained 61 ppb total hydrocarbons. All other wells sampled on that date contained no detectable levels of BTEX, MTBE, or total hydrocarbons. The lack of hydrocarbons in the groundwater near the old tanks on June 25th contrasts with the presence of significant concentrations on the sampling date, May 18th.

Possible sources of these chlorinated compounds could include the landfill, industrial plants in the vicinity of the paper mill or waste disposed of in the past along the river bank. A review of aerial photographs of the area and a visual inspection of the site uncovered no evidence that dumping of contaminants in this area has occurred in the past. The BTEX and MTBE which was detected in the groundwater near the old tanks may have originated from an underground gasoline storage tank which was removed from the vicinity of the new #6 oil tanks approximately three years ago. Information regarding this tank is limited. It is possible that this tank may have been leaking or that overfills resulted in inadvertent spills which may account for the presence of these compounds in the groundwater. The Specialty Paperboard Mill does not currently use chlorinated compounds in its manufacturing processes, however, prior to 1988, small amounts were used in various maintenance procedures. It is possible that inadvertent releases of these compounds may have resulted in the presence of subsurface chlorinated contamination.

#### 4.0 CONCLUSIONS

Based on the above observations made during the initial subsurface investigation, Griffin International has reached the following conclusions regarding subsurface petroleum and halocarbon contamination at Specialty Paperboard:

1. There was a release of #6 heating oil to the subsurface, from a leak in one of the two underground storage tanks. The amount and duration of the release have not been determined. The release has resulted in contamination of soils in the vicinity of the tank. Most of the contamination is contained in the unsaturated zone and extends approximately 70 feet to the water table in some locations. Some of the contamination is presently floating on the water table and over time, the amount of floating product could increase. It is assumed that the leaky tank was the only source of the #6 oil contamination. That source was removed in February, 1990. The adsorbed contamination is periodically providing a source of dissolved hydrocarbon contamination in the groundwater. As precipitation percolates through the adsorbed contamination and, as groundwater comes in contact with it, hydrocarbons slowly become liberated into the dissolved phase resulting in

2. In addition to #6 oil contamination, there are also low concentrations of chlorinated compounds and compounds typically found in gasoline. These compounds have been found in the groundwater, both in the vicinity of the old #6 oil tanks and in two of the three landfill monitoring wells. Their source(s) have not yet been determined.
3. The soils in the area of concern are of deltaic origin and consist of one foot thick stratigraphic sequences. The sequences consist of fine, silty sand near the bottom of each sequence and grade upward to coarser, well rounded, well sorted sand. The finer, silty sand likely has a lower permeability than the coarser sand.
4. Although our data are incomplete, we are concluding that the bedding planes, along which these stratigraphic sequences were deposited, are dipping, slightly, to the south, due to the general nature of deltaic deposits.
5. As the petroleum flowed into the surrounding soils, it tended to follow these bedding planes horizontally in the dip direction, as well as vertically. The horizontal migration has resulted in contamination of soils in the vicinity of SB-2. It also has resulted in the lack of soil contamination in MW-1 below a depth of 47 feet. Figure 1 illustrates these subsurface conditions.
6. Some of the subsurface #6 oil contamination has reached the water table. In areas where the contamination has reached the groundwater, there is free floating product and dissolved hydrocarbons.
7. The water table beneath the mill is at a depth of approximately 70 feet. On the two separate dates that groundwater measurements were taken, the data indicates that the groundwater was flowing toward the northeast in the vicinity of the #6 oil contamination. This appears to be a local phenomenon, however, as the overall water table measurements indicate that groundwater in the flows to the northwest. Because the water level in the river is two feet above the water table beneath the mill, it is likely that the river was losing water to the aquifer at the time that the measurements were taken.

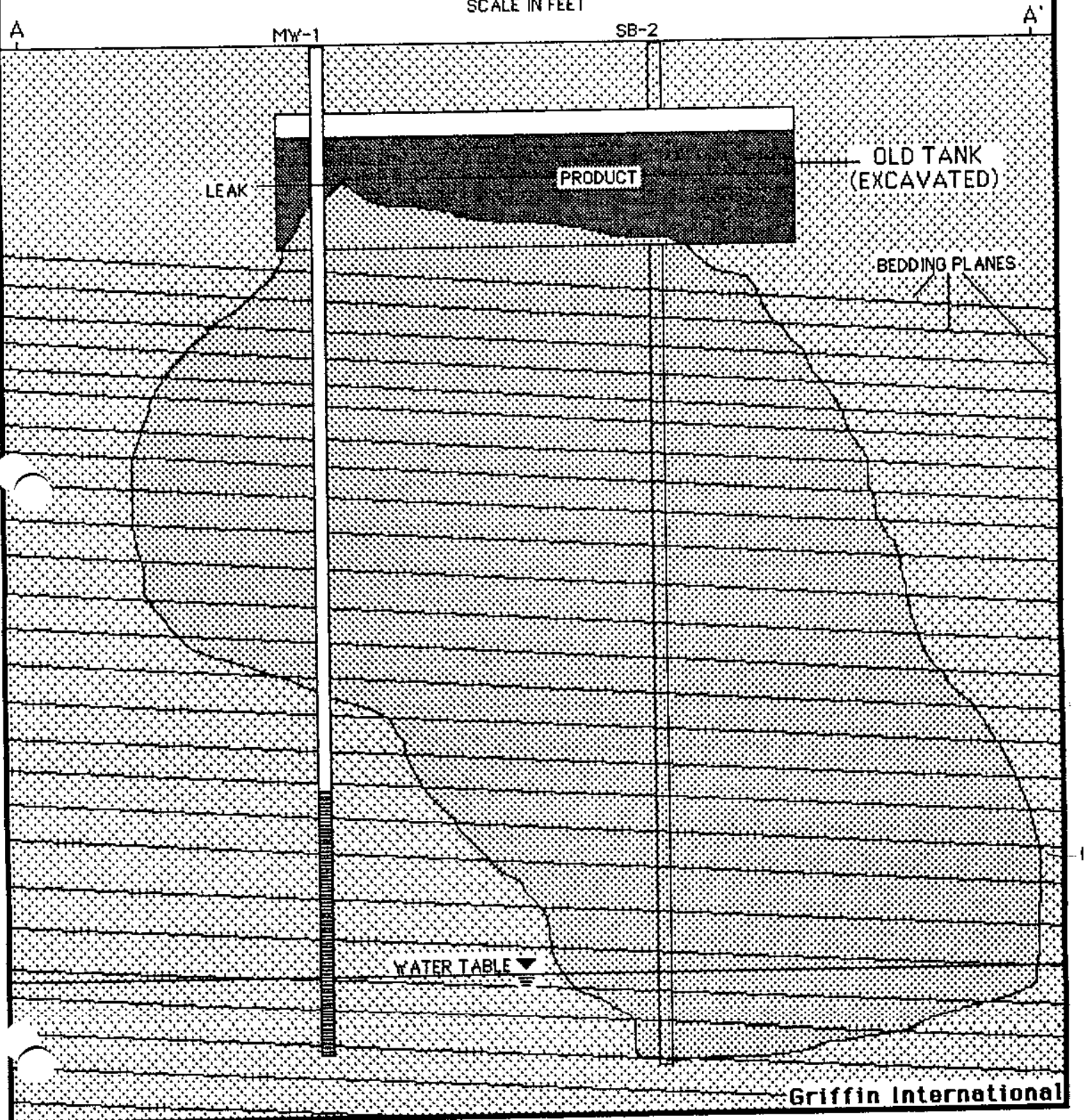
Figure 1.  
**GEOLOGIC CROSS SECTION**  
May, 1990

PROJECT: SPECIALTY PAPER BOARD  
LOCATION: BRATTLEBORO, VERMONT

UNCONTAMINATED SOIL

SOIL CONTAMINATED WITH  
ADSORBED #6 OIL

0 10  
SCALE IN FEET



8. We have identified three possible off site receptors of the subsurface petroleum contamination. They are the water supply wells for the Steak Out Restaurant, the Quality Inn Hotel and the Pepsi Bottling Plant. Additionally, there are two on site supply well used for process water for mill operations. Due to the limited data at this time, it can not be determined which, if any, of these wells could be actual receptors. Because all other buildings in the area are assumed to be supplied by the municipal water system, it is unlikely that they will be impacted by the contamination, however, it is possible that other active water wells do exist in the area that the Brattleboro Utilities Superintendant is not aware of.

## 5.0 RECOMMENDATIONS

Griffin International presents the following recommendations for continued monitoring and remediation of subsurface contamination at Specialty Paperboard:

1. Due to the potential liability presented by the existance of such a large amount of petroleum product in the subsurface, it would be in the best interest of Specialty Paperboard to attempt remediation of the contamination. Griffin International has identified three possible remedial options for this site. They are 1) excavation of the contaminated soils, 2) pumping the contamination from the ground via a double pump or total fluid recovery system, 3) applying bioremediation to the site. Before an option is chosen, we recommend that thorough feasibility studies be conducted for each method.

Excavation of the contaminated soils would involve digging an approximately 70 foot deep by 40 foot wide hole directly adjacent to the mill building. This method would require significant engineering design to minimize disruptions of mill operations. While this method would remove a large portion of the contamination, it would likely not account for all of it. Excavation of such a large hole would disrupt mill operations in the vicinity of the machine shop and could cause damage to the building and upset machine settings. Additionally, provisions would have to be made for proper disposal of the soils.

Removal of the contamination via a drilled recovery well and a double pump or total fluid recovery system, two standard techniques for remediating lighter end petroleum products, would likely be difficult, if not impossible, in this situation. The primary obstacle to the effectiveness of these remediation techniques is that they are primarily used in situations where the bulk of the subsurface petroleum contamination is in the free floating phase. At Specialty Paperboard, the bulk of the contamination is contained in the unsaturated zone. To pump it from the subsurface would require waiting for it to slowly migrate to the water table and then, to the recovery well. Additionally, any floating contamination would be difficult to pump back to the surface due to the high viscosity of #6 oil.

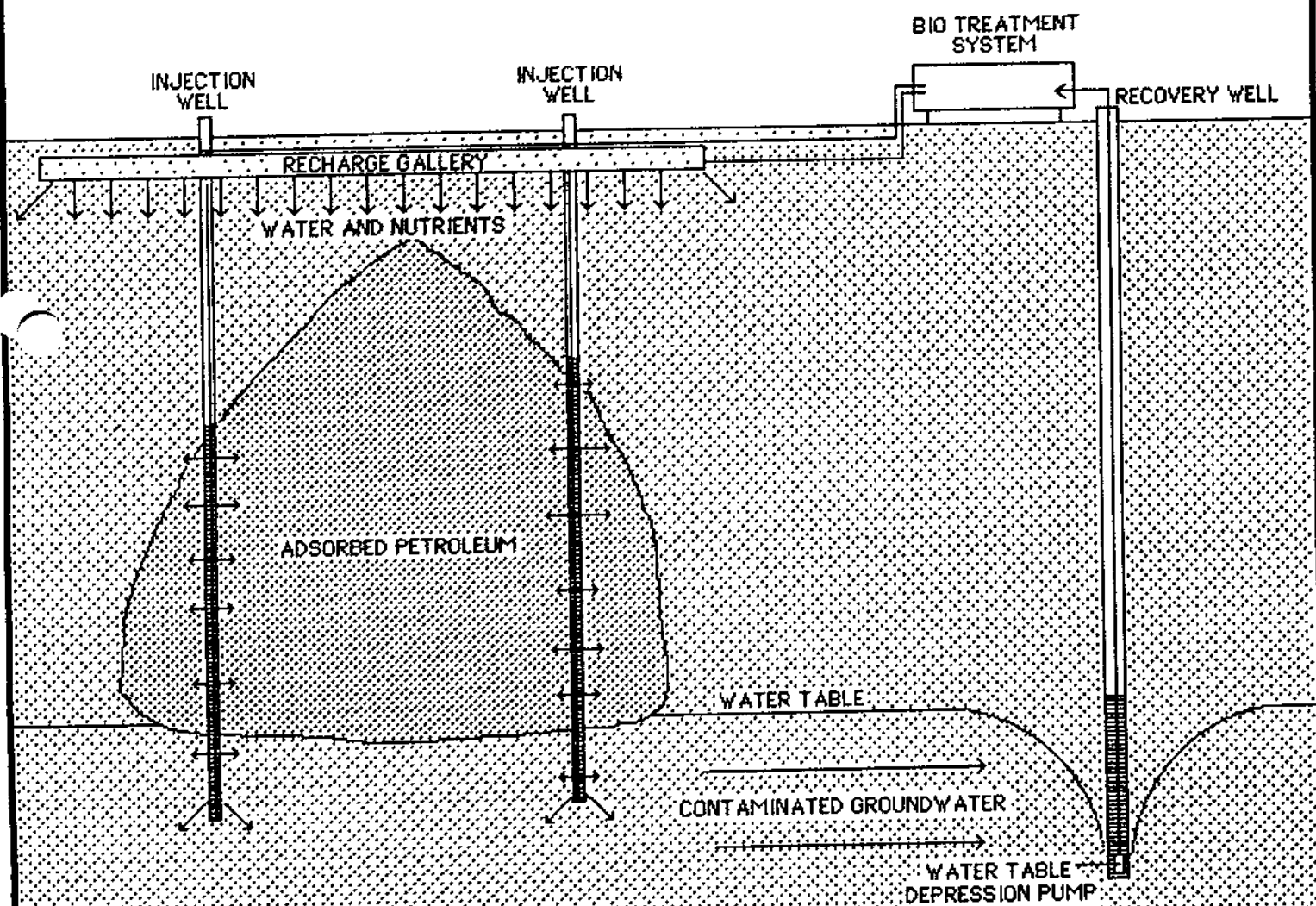
A bioremediation system would consist of a drilled groundwater pumping well, an above ground bio-treatment system and a nutrient and dissolved oxygen recharge gallery. This system would pump contaminated water from a location immediately downgradient of the contamination plume. The water would be pumped from the well to an above ground bio-treatment system. The bio-treatment system would consist of a fixed-film bioreactor and a nutrient feed system. The contaminated groundwater flow past the fixed film bioreactor which would result in a significant decrease in dissolved contamination levels. Once the water flows past the bioreactor it is sent to the nutrient feed system which adds dissolved oxygen, bacteria and nutrients to the water. The water is then reintroduced to the subsurface via a recharge gallery and one or two injection wells. The recharge of nutrient rich water into the soil matrix will stimulate the biological activity in the subsurface, effectively converting the subsurface into a large bioreactor system. Additionally, the flushing action of the recharge drives the more water soluble contaminants from the adsorbed phase to the dissolved phase which will then be captured by the recovery well and pumped through the above ground bioreactor for bioreaction. This approach could greatly reduce the time required for remediation when compared to a double pump or total fluid recovery system. The two disadvantages which should be considered with this technique are the amount of monitoring which would be required to assure the effectiveness of the process and the difficulties in adequately distributing the nutrients throughout the contamination plume.



Figure 2.  
**PROPOSED SUBSURFACE TREATMENT SYSTEM  
CROSS SECTIONAL DIAGRAM**

**SPECIALTY PAPERBOARD  
BRATTLEBORO, VERMONT**

**SCALE: 1" = 20'**



**Griffin International**

2. Prior to remediation, it is recommended that the monitoring wells be sampled again for analysis using EPA Method 624. This method tests for the same compounds that Methods 601 and 602 test for but it uses a mass spec confirmation which tends to be more precise.

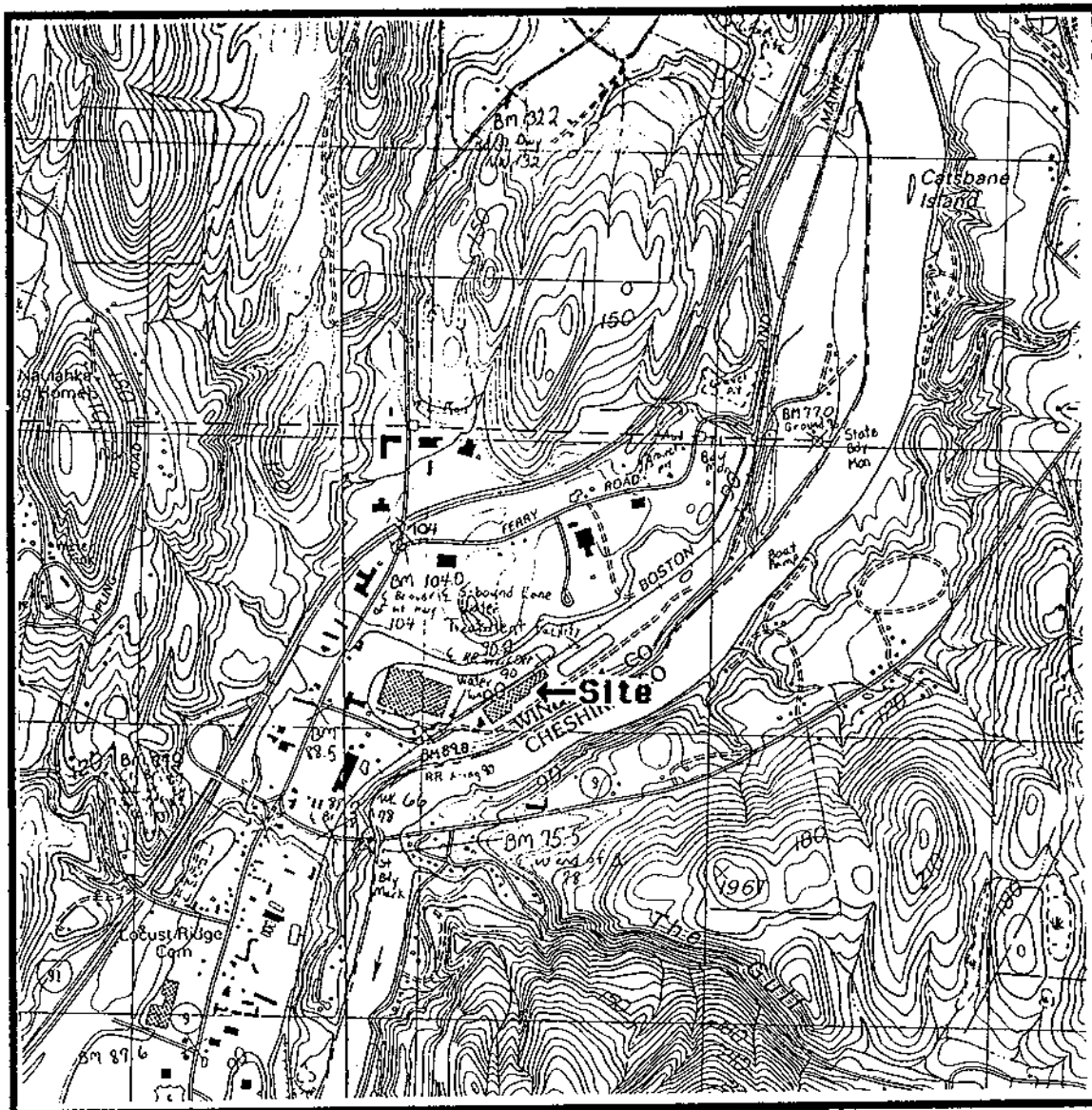
3. It is recommended that additional downgradient monitoring wells be installed to determine the downgradient extent of the groundwater contamination and to more adequately define groundwater gradient and flow direction.

4. To verify that the Connecticut River is a losing stream and that groundwater in the vicinity of the mill flows toward the northwest, we recommend that all water levels across the site be resurveyed.

## APPENDIX A

### Site Maps

PROJECT: SPECIALTY PAPERBOARD  
LOCATION: BRATTLEBORD, VERMONT



SOURCE: U.S.G.S. 7.5 x 15 MIN. NEWFANE QUADRANGLE, 1984

SCALE 1 : 25,000

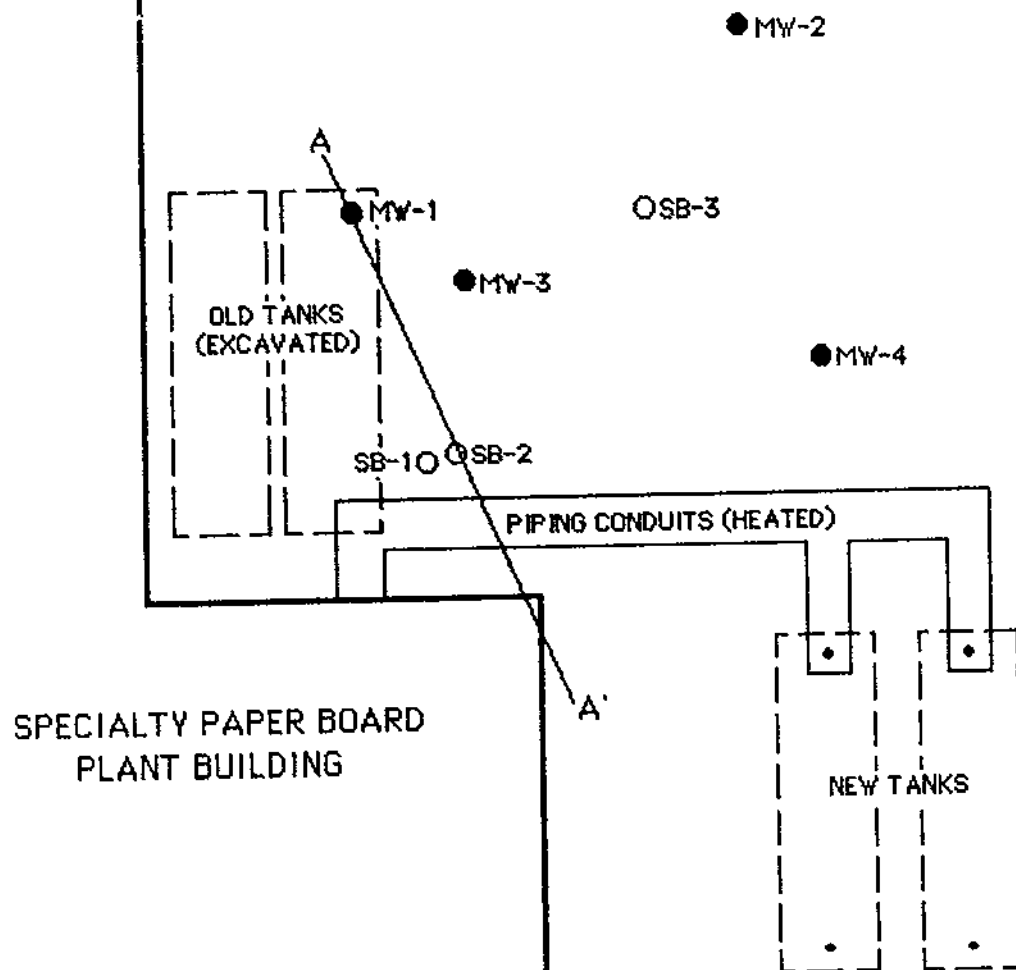
## SITE MAP

PROJECT: SPECIALTY PAPER BOARD  
LOCATION: BRATTLEBORO, VERMONT

○ SOIL BORING

● MONITORING WELL

A — A' CROSS SECTION LINE  
FOR FIGURE 1



# GROUNDWATER CONTOUR MAP

PROJECT: SPECIALTY PAPER BOARD  
LOCATION: BRATTLEBORO, VERMONT  
MONITORING DATE: 5/18/90

○ SOIL BORING

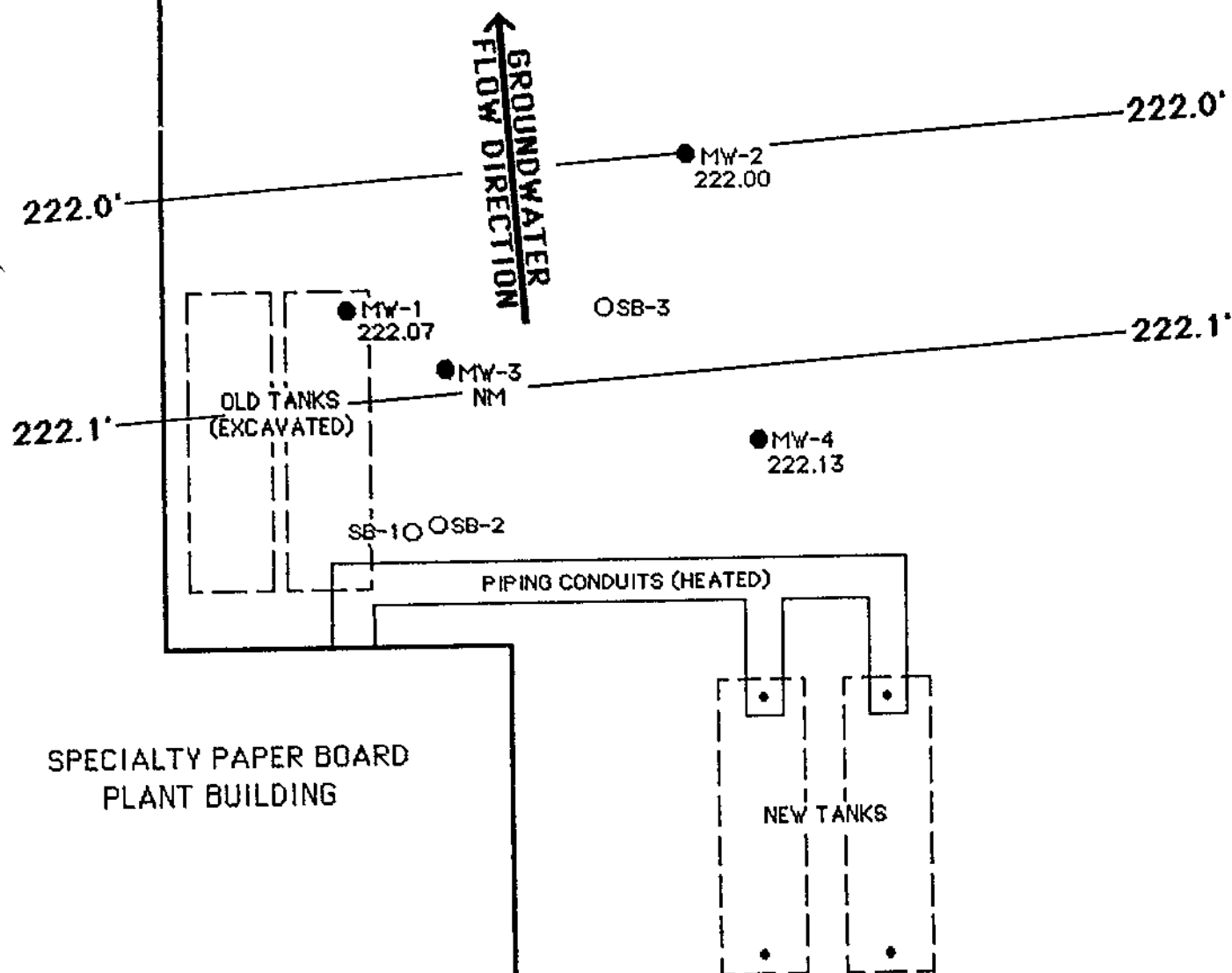
● MONITORING WELL

WELL IDENTIFICATION:

MW-1 - WELL I.D.

222.07- WATER TABLE ELEVATION, IN FEET  
ABOVE SEA LEVEL

NM - NO MEASUREMENT TAKEN



# GROUNDWATER CONTOUR MAP

PROJECT: SPECIALTY PAPER BOARD  
LOCATION: BRATTLEBORO, VERMONT  
MONITORING DATE: 6/25/90

○ SOIL BORING

● MONITORING WELL

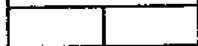
WELL IDENTIFICATION:

MW-1 - WELL I.D.

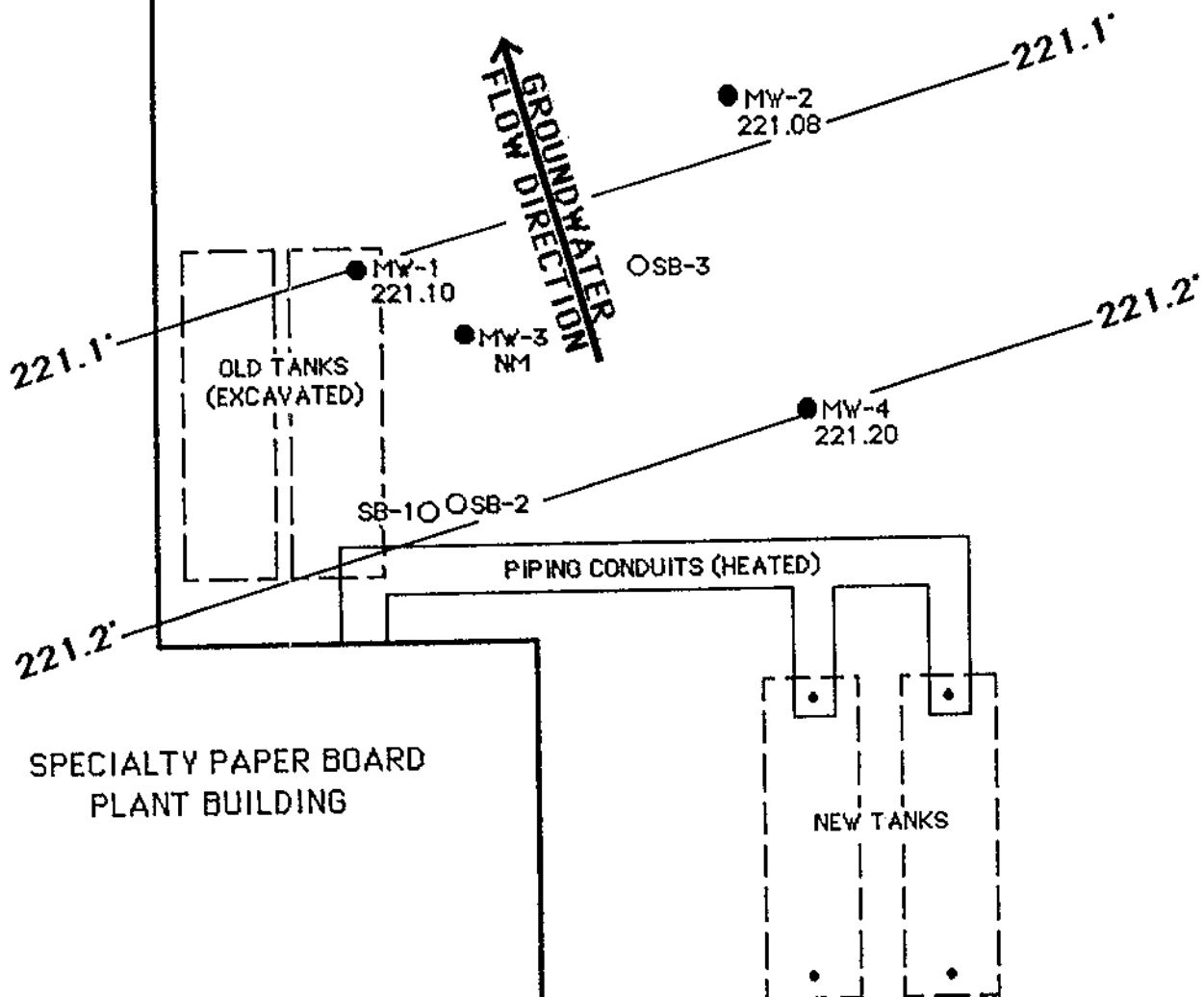
221.10 - WATER TABLE ELEVATION, IN FEET  
ABOVE SEA LEVEL

NM - NO MEASUREMENT TAKEN

0 20



SCALE IN FEET



# TOTAL HYDROCARBONS IN GROUNDWATER

PROJECT: SPECIALTY PAPER BOARD  
LOCATION: BRATTLEBORO, VERMONT  
MONITORING DATE: 5/18/90

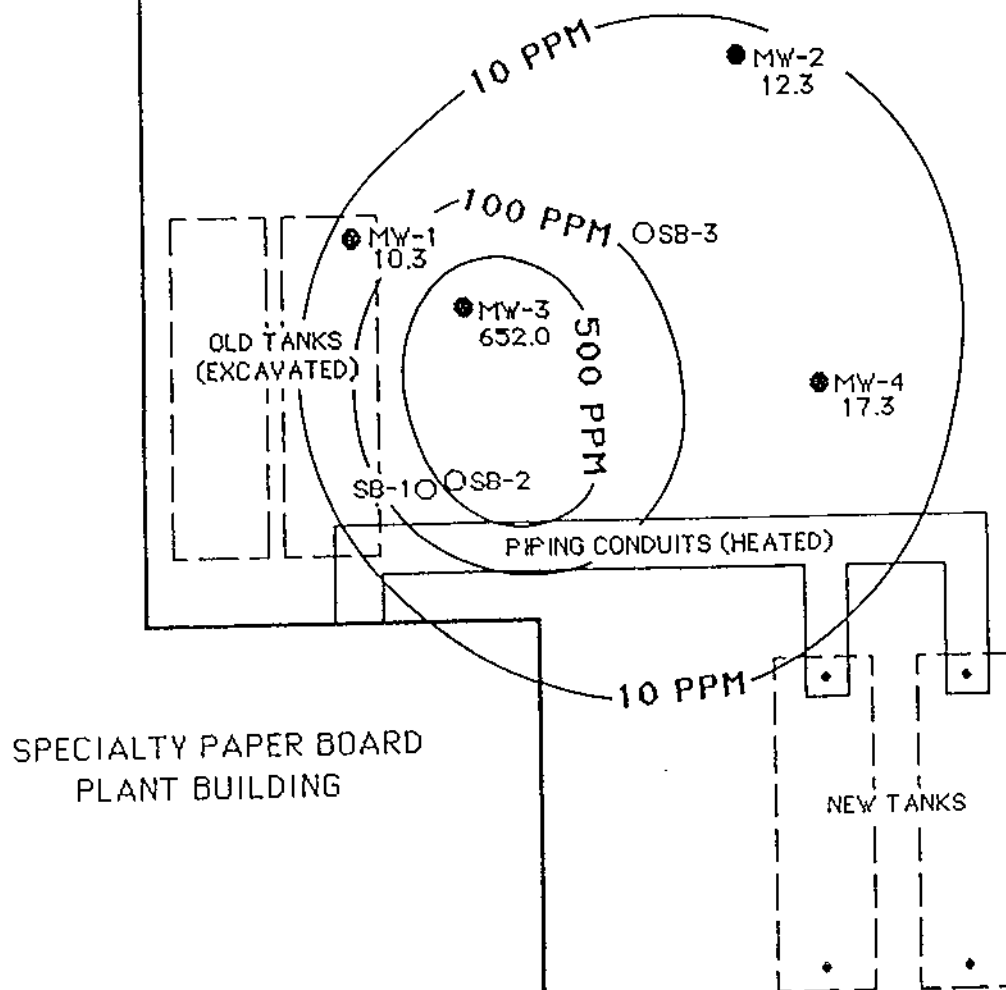
○ SOIL BORING

● MONITORING WELL

WELL IDENTIFICATION:

MW-1 - WELL I.D.

10.3 - TOTAL HYDROCARBON  
CONCENTRATION IN GROUNDWATER,  
PPM





EXTENT OF ADSORBED  
#6 OIL CONTAMINATION  
MAY, 1990

PROJECT: SPECIALTY PAPER BOARD  
LOCATION: BRATTLEBORO, VERMONT

○ SOIL BORING

● MONITORING WELL

◼ AREA CONTAMINATED WITH ADSORBED  
#6 OIL



● MW-2

○ SB-3

PROBABLE EXTENT OF  
ADSORBED #6 OIL CONTAMINATION

● MW-4

OLD TANKS  
(EXCAVATED)

● MY-1

● MY-3

SB-1

○ SB-2

PIPING/CONDUITS (HEATED)

SPECIALTY PAPER BOARD  
PLANT BUILDING

NEW TANKS

## PURGEABLE HALOCARBONS IN GROUNDWATER

PROJECT: SPECIALTY PAPER BOARD  
LOCATION: BRATTLEBORO, VERMONT  
MONITORING DATES: 5/18/90 AND 6/25/90

- SOIL BORING
- MONITORING WELL

WELL IDENTIFICATION:  
MW-1 - WELL I.D.  
39.90 - PURGEABLE HALOCARBONS IN  
GROUNDWATER, PPB



● MW-2  
75.41 - 5/18/90  
46.30 - 6/25/90

○ SB-3

● MW-1  
38.78 - 5/18/90  
39.90 - 6/25/90  
OLD TANKS  
(EXCAVATED)

● MW-3  
21.89 - 5/18/90  
NOT SAMPLED - 6/25/90

● MW-4  
32.71 - 5/18/90  
14.08 - 6/25/90

○ SB-1 ○ SB-2

PIPING CONDUITS (HEATED)

SPECIALTY PAPER BOARD  
PLANT BUILDING

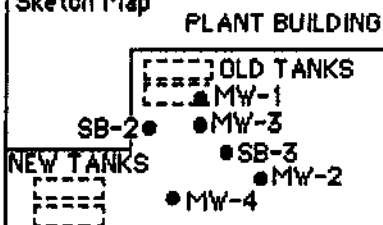
NEW TANKS

## APPENDIX B

### Well Logs

PROJECT SPECIALTY PAPERBOARDLOCATION BRATTLEBORO, VERMONTDATE DRILLED 3/14/90 TOTAL DEPTH OF HOLE 80'METER 6"SCREEN DIA. 2" LENGTH 20' SLOT SIZE .010"CASING DIA. 2" LENGTH 59' TYPE PVCDRILLING CO. EAST COAST DRILLING METHOD HOLLOW STEM AUGERDRILLER DAVE LOG BY P. MURRAYWELL NUMBER MW-3

Sketch Map



DEPTH IN FEET	WELL CONSTRUCTION	NOTES	BLOWS PER 6" OF SPOON	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
0		ROAD BOX CAP		Fine to medium SAND, fine to coarse GRAVEL, some silt
2		CONCRETE		
4				Fine brown silty SAND NO APPARENT PETROLEUM CONTAMINATION
6				
8				
10			4,5,7,9	
12				Fine SAND, some silt, few cobbles NO APPARENT PETROLEUM CONTAMINATION
14			6,17,19,22	
16				Fine to medium SAND, little silt SLIGHT PETROLEUM ODOR 1 PPM
18		WELL CASING	9,3,17,24	
20				THICK, BLACK PETROLEUM CONTAMINATION BEGINNING AT 21.5'
22				
24			15,15,16,25	20 PPM
26		NATIVE BACKFILL		Fine to medium SAND, little silt loose, warm asphalt consistency
28				
30			10,12,13,18	32 PPM
32				
34			20,18,25,30	16 PPM
36				
38			7,15,17,21	21 PPM
40				
42			16,24,17,20	20 PPM
44				THICK, BLACK PETROLEUM CONTAMINATION
46				
48				
50			14,25,24,28	15 PPM
52				

Griffin International

PROJECT SPECIALTY PAPERBOARDLOCATION BRATTLEBORO, VERMONTDATE DRILLED 5/14/90 TOTAL DEPTH OF HOLE 80'DIAMETER 6"SCREEN DIA. 2" LENGTH 20' SLOT SIZE .010"CASING DIA. 2" LENGTH 59' TYPE PVCDRILLING CO. EAST COAST DRILLING METHOD HOLLOW STEM AUGERDRILLER DAVE LOG BY P. MURRAYWELL NUMBER MW-3 CONT.

Sketch Map

PLANT BUILDING

OLD TANKS

MW-1

MW-3

SB-3

MW-2

MW-4

NEW TANKS



DEPTH IN FEET	WELL CONSTRUCTION	NOTES	BLOWS PER 6" OF SPOON	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
54		BENTONITE		Brown, fine to coarse SAND, some fine gravel
56			15,22,18,26	22 PPM
58		WELL CASING		HEAVY, BLACK PETROLEUM CONTAMINATION
60			23,30,31,35	28 PPM
62				
64			20,19,23,29	38 PPM
66		GRAVEL PACK		WATER TABLE ▼
68				3 PPM
70		WELL SCREEN	20,20,23,27	DISTICT LINE BETWEEN HEAVY BLACK PETROLEUM CONTAMINATION AND RELATIVELY CLEAN SOIL AT WATER TABLE IN 65' - 67' SPLIT SPOON SAMPLE
72				
74				
76				Wet, brown, fine to coarse SAND, some fine gravel
78				1 PPM
80		BOTTOM CAP		BASE OF EXPLORATION AT 80'
82				
84				
86				
88				
90				
92				
94				
96				
98				
100				
102				
104				
106				

Griffin International

PROJECT SPECIALTY PAPERBOARDLOCATION BRATTLEBORO, VERMONTDATE DRILLED 5/15/90 TOTAL DEPTH OF HOLE 72'METER 6"SCREEN DIA. NA LENGTH NA SLOT SIZE NACASING DIA. NA LENGTH NA TYPE NADRILLING CO. EAST COAST DRILLING METHOD HOLLOW STEM AUGERDRILLER DAVE LOG BY P. MURRAYWELL NUMBER SB-2

Sketch Map

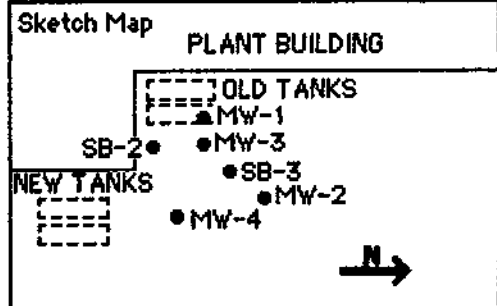
PLANT BUILDING

OLD TANKS  
MW-1  
SB-2  
NEW TANKS  
MW-3  
MW-2  
MW-4



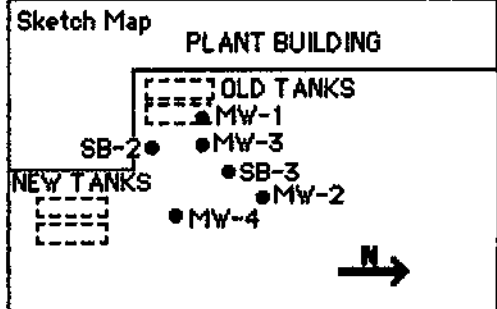
DEPTH IN FEET	WELL CONSTRUCTION	NOTES	BLOWS PER 6" OF SPOON	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
0	NO WELL SET	CONCRETE		
2				
4				Light brown, fine SAND, some silt
6				
8				
10				
12				0.5 PPM
14			10,13,15,19	Highly contaminated, black, oily, medium to coarse SAND, very warm to the touch
16		NATIVE BACKFILL		
18				9 PPM
20			15,19,23,27	Horizontal lamination, alternating between fine, silty SAND and medium to coarse SAND with some fine gravel. Petroleum product more prevalent in the coarser laminae.
22				18 PPM
24			13,21,26,30	
26				25 PPM
28				
30			19,40,32,36	
32				35 PPM
34			19,22,24,28	Petroleum product almost dripping from soil, very warm to the touch.
36				40 PPM
38			18,23,34,37	
40				30 PPM
42			27,25,28,32	
44				38 PPM
46				
48				
50			16,26,23,27	
52				

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PROJECT SPECIALTY PAPERBOARDLOCATION BRATTLEBORO, VERMONTDATE DRILLED 5/15/90 TOTAL DEPTH OF HOLE 72'DIAMETER 6"SCREEN DIA. NA LENGTH NA SLOT SIZE NACASING DIA. NA LENGTH NA TYPE NADRILLING CO. EAST COAST DRILLING METHOD HOLLOW STEM AUGERDRILLER DAVE LOG BY P. MURRAYWELL NUMBER SB-2 CONT.

DEPTH IN FEET	WELL CONSTRUCTION	NOTES	BLOWS PER 6" OF SPOON	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
54	NATIVE BACKFILL		24,24,26,29	55 PPM
56				Alternating layers of fine to coarse SAND
58				HEAVY, BLACK PETROLEUM CONTAMINATION
60			20,22,33,36	39 PPM
62				
64				35 PPM
66			20,25,29,34	
68				30 PPM
70			13,20,32,32	DISTINCT LINE BETWEEN BLACK, PETROLEUM CONTAMINATED SOIL AND RELATIVELY CLEAN
72				SOIL NEAR BOTTOM OF 70' TO 72' SPLIT SPOON SAMPLE
74			14,27,25,31	Clean, wet, fine to coarse SAND, some silt
76				8 PPM
78				BASE OF EXPLORTATION AT 76'
80				
82				
84				
86				
88				
90				
92				
94				
96				
98				
100				
102				
104				
106				

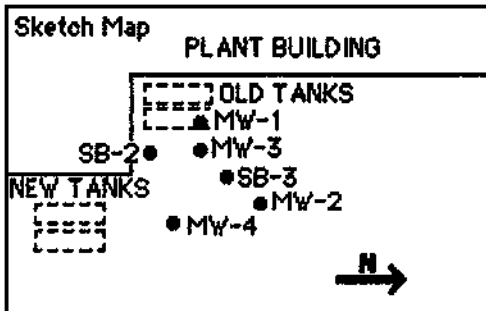
Griffin International

PROJECT SPECIALTY PAPERBOARDLOCATION BRATTLEBORO, VERMONTDATE DRILLED 5/15/90 TOTAL DEPTH OF HOLE 72'DIAMETER 6"SCREEN DIA. NA LENGTH NA SLOT SIZE NACASING DIA. NA LENGTH NA TYPE NADRILLING CO. EAST COAST DRILLING METHOD HOLLOW STEM AUGERDRILLER DAVE LOG BY P. MURRAYWELL NUMBER SB-3

DEPTH IN FEET	WELL CONSTRUCTION	NOTES	BLOWS PER 6" OF SPOON	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
0		CONCRETE		Fine, light brown SAND, some silt  NO APPARENT PETROLEUM CONTAMINATION
2				
4				
6				
8		NATIVE BACKFILL	17,25,20,29	Alternating layers of fine to medium, well rounded SAND with some silt and lighter colored, well rounded, quartz SAND, trace of silt
10				
12				
14				
16			10,15,18,21	Stratigraphic cycles, approximately 1' thick, coarsening upwards, ie, finer, silty sand layers on bottom of sequence, coarser sand on top of sequence.
18				
20				
22				
24			18,25,17,19	NO DETECTABLE PETROLEUM CONTAMINATION
26				
28				
30				
32			12,18,25,23	Alternating layers of fine to medium, well rounded SAND, some silt, and coarser, light colored, well rounded, quartz SAND, little fine gravel Stratigraphic cycles, 1' thick, coarsening upwards
34				
36				
38				
40				NO DETECTABLE PETROLEUM CONTAMINATION
42				
44				
46				
48				
50				
52				

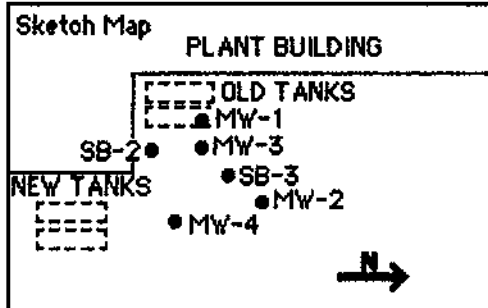
Griffin International



PROJECT SPECIALTY PAPERBOARDLOCATION BRATTLEBORO, VERMONTDATE DRILLED 5/15/90 TOTAL DEPTH OF HOLE 72'DIAMETER 6"SCREEN DIA. NA LENGTH NA SLOT SIZE NACASING DIA. NA LENGTH NA TYPE NADRILLING CO. EAST COAST DRILLING METHOD HOLLOW STEM AUGERDRILLER DAVE LOG BY P. MURRAYWELL NUMBER SB-3 CONT.

DEPTH IN FEET	WELL CONSTRUCTION	NOTES	BLOWS PER 6" OF SPOON	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
-54		NATIVE BACKFILL	24,34,29,35	Alternating layers of fine to medium, well rounded SAND with some silt and coarser, well rounded quartz SAND. Stratigraphic cycles coarsening upwards.
-56				
-58				
-60			13,26,16,18	
-62				NO DETECTABLE PETROLEUM CONTAMINATION
-64				
-66			16,27,29,35	
-68				WATER TABLE ▼
-70				Wet, fine to coarse SAND, some silt
-72			15,17,16,20	NO DETECTABLE PETROLEUM CONTAMINATION
-74				BASE OF EXPLORATION AT 72'
-76				
-78				
-80				
-82				
-84				
-86				
-88				
-90				
-92				
-94				
-96				
-98				
-100				
-102				
-104				
-106				

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PROJECT SPECIALTY PAPERBOARDLOCATION BRATTLEBORO, VERMONTDATE DRILLED 5/16/90 TOTAL DEPTH OF HOLE 85'DIAMETER 6"SCREEN DIA. 2" LENGTH 25' SLOT SIZE .010"CASING DIA. 2" LENGTH 58.5' TYPE PVCDRILLING CO. EAST COAST DRILLING METHOD HOLLOW STEM AUGERDRILLER DAVE LOG BY P. MURRAYWELL NUMBER MW-4

DEPTH IN FEET	WELL CONSTRUCTION	NOTES	BLOWS PER 6" OF SPOON	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
0	ROAD BOX CONCRETE TOP CAP			
2				
4	WELL CASING			Light brown, fine to coarse SAND, some silt, few cobbles at 12'- 13'
6				
8				
10				
12				
14				
16				
18				
20				
22				
24	NATIVE BACKFILL		18,11,18,21	NO DETECTABLE PETROLEUM CONTAMINATION
26				
28				
30				
32				
34				
36				
38				
40				
42				
44			11,14,15,24	Alternating layers of fine to medium, SAND with some silt and well sorted, well rounded, coarser quartz SAND, trace silt. Stratigraphic sequences approximately 1' thick, coarsening upwards.
46				
48				
50				
52				
54				
56				
58				
60				
62				
64			15,19,24,26	NO DETECTABLE PETROLEUM CONTAMINATION
66				
68				
70				
72				
74				
76				
78				
80				
82				
84			23,29,28,30	Alternating layers of tight, dry, fine to medium, SAND with some silt and coarse, well rounded, well sorted quartz SAND, little gravel, trace silt
86				
88				
90				
92				
94				
96				
98				
100				
102				
104			13,17,28,34	NO DETECTABLE PETROLEUM CONTAMINATION
106				
108				
110				
112				
114				
116				
118				
120				
122				

Griffin International

PROJECT SPECIALTY PAPERBOARDLOCATION BRATTLEBORO, VERMONTDATE DRILLED 5/16/90 TOTAL DEPTH OF HOLE 85'DIAMETER 6"SCREEN DIA. 2" LENGTH 25' SLOT SIZE .010"CASING DIA. 2" LENGTH 58.5' TYPE PVCDRILLING CO. EAST COAST DRILLING METHOD HOLLOW STEM AUGERDRILLER DAVE LOG BY P. MURRAYWELL NUMBER MW-4 CONT.

Sketch Map

PLANT BUILDING

OLD TANKS  
 MW-1  
 MW-3  
 SB-2  
 SB-3  
 MW-2  
 MW-4  
 NEW TANKS



DEPTH IN FEET	WELL CONSTRUCTION	NOTES	BLOWS PER 6" OF SPOON	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
54		BENTONITE		
56		WELL CASING	16,32,37,35	1' stratigraphic sequences, coarsening upwards from fine to medium SAND with some silt to coarse, well rounded, well sorted, quartz SAND with a little gravel. Dry to a depth of 65'
58				
60			22,21,26,40	
62				NO DETECTABLE PETROLEUM CONTAMINATION
64				
66		WELL SCREEN	12,17,21,31	WATER TABLE ▼
68				
70		GRAVEL PACK	24,22,25,45	Wet, stratified, fine to coarse SAND, some silt
72				
74				NO DETECTABLE PETROLEUM CONTAMINATION
76				
78				
80				
82				
84		BOTTOM CAP		BASE OF EXPLORATION AT 85'
86				
88				
90				
92				
94				
96				
98				
100				
102				
104				
106				

Griffin International

APPENDIX C

Laboratory Results



**ENDYNE, INC.**

Laboratory Services

32 James Brown Drive  
Williston, Vermont 05495  
(802) 879-4333  
FAX 879-7103

LABORATORY REPORT

TOTAL HYDROCARBONS - EPA METHOD 418.1

CLIENT: Griffin International  
REPORT DATE: May 31, 1990  
PROJECT NAME: Specialty Paperboard  
DATE SAMPLED: May 18, 1990  
DATE RECEIVED: May 21, 1990  
DATE ANALYZED: May 30, 1990  
SAMPLER: P. Schuyler

<u>Reference number:</u>	<u>Concentration (mg/L)<sup>1</sup></u>
12,164	17.3
12,165	12.3
12,166	10.3
12,167*	652.
12,168	<0.8

Sample ID:

12,164:	MW-4;	10:05
12,165:	MW-2;	11:15
12,166:	MW-1;	12:30
12,167:	MW-3;	12:45
12,168:	Blank;	12:50

Notes:

- 1 Method detection limit is 0.8 ppm  
\* Method detection limit is 8.0 ppm

Reviewed by

Suzanne M. Theriot



**ENDYNE, INC.**

Laboratory Services

32 James Brown Drive  
Williston, Vermont 05495  
(802) 879-4333  
FAX 879-7103

LABORATORY REPORT  
EPA METHOD 601 -- PURGEABLE HALOCARBONS

CLIENT: Griffin International  
REPORT DATE: May 31, 1990  
PROJECT NAME: Specialty Paperboard  
SAMPLER: P. Schuyler  
DATE SAMPLED: May 18, 1990  
DATE RECEIVED: May 21, 1990

ANALYSIS DATE: May 30, 1990  
STATION: MW 1  
REF.#: 12,161  
TIME SAMPLED: 12:30

<u>Parameter</u>	<u>Concentration (ug/L)</u> <sup>1</sup>
Bromodichloromethane	ND <sup>2</sup>
Bromoform	ND
Bromomethane	ND
Carbon tetrachloride	ND
Chlorobenzene	ND
Chloroethane	ND
2-Chloroethylvinyl ether	ND
Chloroform	ND
Chloromethane	ND
Dibromochloromethane	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
Dichlorodifluoromethane	ND
1,1-Dichloroethane	ND
1,2-Dichloroethane	ND
1,1-Dichloroethene	ND
trans-1,2-Dichloroethene	ND
1,2-Dichloropropane	ND
cis-1,3-Dichloropropene	ND
trans-1,3-Dichloropropene	ND
Methylene Chloride	PLE <sup>3</sup>
1,1,2,2-Tetrachloroethane	ND
Tetrachloroethene	7.50
1,1,1-Trichloroethane	17.9
1,1,2-Trichloroethane	ND
Trichloroethene	ND
Trichlorofluoromethane	11.8
Vinyl Chloride	1.58

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0  
NOTES:

- 1 Method 601 detection limit is 1 ug/L
- 2 None detected
- 3 Present in background laboratory environment

Reviewed by: Suzanne M. Shendahl



**ENDYNE, INC.**

Laboratory Services

32 James Brown Drive  
Williston, Vermont 05495  
(802) 879-4333  
FAX 879-7103

LABORATORY REPORT  
EPA METHOD 601 -- PURGEABLE HALOCARBONS

CLIENT: Griffin International  
REPORT DATE: May 31, 1990  
PROJECT NAME: Specialty Paperboard  
SAMPLER: P. Schuyler  
DATE SAMPLED: May 18, 1990  
DATE RECEIVED: May 21, 1990

ANALYSIS DATE: May 30, 1990  
STATION: MW 2  
REF.#: 12,160  
TIME SAMPLED: 11:15

<u>Parameter</u>	<u>Concentration (ug/L)</u> <sup>1</sup>
Bromodichloromethane	ND <sup>2</sup>
Bromoform	ND
Bromomethane	ND
Carbon tetrachloride	ND
Chlorobenzene	ND
Chloroethane	ND
2-Chloroethylvinyl ether	ND
Chloroform	ND
Chloromethane	ND
Dibromochloromethane	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
Dichlorodifluoromethane	ND
1,1-Dichloroethane	ND
1,2-Dichloroethane	ND
1,1-Dichloroethene	ND
trans-1,2-Dichloroethene	ND
1,2-Dichloropropane	ND
cis-1,3-Dichloropropene	ND
trans-1,3-Dichloropropene	ND
Methylene Chloride	PLE <sup>3</sup>
1,1,2,2-Tetrachloroethane	ND
Tetrachloroethene	6.80
1,1,1-Trichloroethane	14.7
1,1,2-Trichloroethane	ND
Trichloroethene	ND
Trichlorofluoromethane	46.9
Vinyl Chloride	7.01

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:

- 1 Method 601 detection limit is 1 ug/L
- 2 None detected
- 3 Present in background laboratory environment

Reviewed by: Suzanne M. Grenier



**ENDYNE, INC.**

Laboratory Services

32 James Brown Drive  
Williston, Vermont 05495  
(802) 879-4333  
FAX 879-7103

LABORATORY REPORT  
EPA METHOD 601 -- PURGEABLE HALOCARBONS

CLIENT: Griffin International  
REPORT DATE: May 31, 1990  
PROJECT NAME: Specialty Paperboard  
SAMPLER: P. Schuyler  
DATE SAMPLED: May 18, 1990  
DATE RECEIVED: May 21, 1990

ANALYSIS DATE: May 30, 1990  
STATION: MW 3  
REF.#: 12,162  
TIME SAMPLED: 12:45

<u>Parameter</u>	<u>Concentration (ug/L)<sup>1</sup></u>
Bromodichloromethane	ND <sup>2</sup>
Bromoform	ND
Bromomethane	ND
Carbon tetrachloride	ND
Chlorobenzene	ND
Chloroethane	ND
2-Chloroethylvinyl ether	ND
Chloroform	ND
Chloromethane	ND
Dibromochloromethane	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
Dichlorodifluoromethane	ND
1,1-Dichloroethane	ND
1,2-Dichloroethane	ND
1,1-Dichloroethene	ND
trans-1,2-Dichloroethene	ND
1,2-Dichloropropane	ND
cis-1,3-Dichloropropene	ND
trans-1,3-Dichloropropene	ND
Methylene Chloride	PLE <sup>3</sup>
1,1,2,2-Tetrachloroethane	ND
Tetrachloroethene	ND
1,1,1-Trichloroethane	7.49
1,1,2-Trichloroethane	ND
Trichloroethene	ND
Trichlorofluoromethane	ND
Vinyl Chloride	14.4

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0  
NOTES:

- 1 Method 601 detection limit is 1 ug/L
- 2 None detected
- 3 Present in background laboratory environment

Reviewed by: Suzanne M. Fernald





**ENDYNE, INC.**

Laboratory Services

32 James Brown Drive  
Williston, Vermont 05495  
(802) 879-4333  
FAX 879-7103

LABORATORY REPORT  
EPA METHOD 601 -- PURGEABLE HALOCARBONS

CLIENT: Griffin International  
REPORT DATE: May 31, 1990  
PROJECT NAME: Specialty Paperboard  
SAMPLER: P. Schuyler  
DATE SAMPLED: May 18, 1990  
DATE RECEIVED: May 21, 1990

ANALYSIS DATE: May 30, 1990  
STATION: MW 4  
REF.#: 12,159  
TIME SAMPLED: 11:05

<u>Parameter</u>	<u>Concentration (ug/L)</u> <sup>1</sup>
Bromodichloromethane	ND <sup>2</sup>
Bromoform	ND
Bromomethane	ND
Carbon tetrachloride	ND
Chlorobenzene	ND
Chloroethane	ND
2-Chloroethylvinyl ether	ND
Chloroform	ND
Chloromethane	ND
Dibromochloromethane	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
Dichlorodifluoromethane	ND
1,1-Dichloroethane	ND
1,2-Dichloroethane	ND
1,1-Dichloroethene	ND
trans-1,2-Dichloroethene	ND
1,2-Dichloropropane	ND
cis-1,3-Dichloropropene	ND
trans-1,3-Dichloropropene	ND
Methylene Chloride	PLE <sup>3</sup>
1,1,2,2-Tetrachloroethane	ND
Tetrachloroethene	4.36
1,1,1-Trichloroethane	6.91
1,1,2-Trichloroethane	ND
Trichloroethene	ND
Trichlorofluoromethane	18.1
Vinyl Chloride	3.34

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:

- 1 Method 601 detection limit is 1 ug/L
- 2 None detected
- 3 Present in background laboratory environment

Reviewed by: Suzanne M. Hendale



**ENDYNE, INC.**

**Laboratory Services**

32 James Brown Drive  
Williston, Vermont 05495  
(802) 879-4333  
FAX 879-7103

**LABORATORY REPORT**  
**EPA METHOD 601 -- PURGEABLE HALOCARBONS**

CLIENT: Griffin International  
REPORT DATE: May 31, 1990  
PROJECT NAME: Specialty Paperboard  
SAMPLER: P. Schuyler  
DATE SAMPLED: May 18, 1990  
DATE RECEIVED: May 21, 1990

ANALYSIS DATE: May 30, 1990  
STATION: Blank  
REF.#: 12,163  
TIME SAMPLED: 12:50

<u>Parameter</u>	<u>Concentration (ug/L)</u> <sup>1</sup>
Bromodichloromethane	ND <sup>2</sup>
Bromoform	ND
Bromomethane	ND
Carbon tetrachloride	ND
Chlorobenzene	ND
Chloroethane	ND
2-Chloroethylvinyl ether	ND
Chloroform	ND
Chloromethane	ND
Dibromochloromethane	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
Dichlorodifluoromethane	ND
1,1-Dichloroethane	ND
1,2-Dichloroethane	ND
1,1-Dichloroethene	ND
trans-1,2-Dichloroethene	ND
1,2-Dichloropropane	ND
cis-1,3-Dichloropropene	ND
trans-1,3-Dichloropropene	ND
Methylene Chloride	PLE <sup>3</sup>
1,1,2,2-Tetrachloroethane	ND
Tetrachloroethene	ND
1,1,1-Trichloroethane	ND
1,1,2-Trichloroethane	ND
Trichloroethene	ND
Trichlorofluoromethane	ND
Vinyl Chloride	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:

- 1 Method 601 detection limit is 1 ug/L
- 2 None detected
- 3 Present in background laboratory environment

Reviewed by: Suzanne M. Gendahl



**ENDYNE, INC.**

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FAX 879-7103

LABORATORY REPORT

EPA METHOD 602 -- PURGEABLE AROMATICS

CLIENT: Griffin International  
PROJECT NAME: Specialty Paperboard  
REPORT DATE: May 31, 1990      DATE RECEIVED: May 21, 1990  
ANALYSIS DATE: May 30, 1990      REF.#: 12,161  
DATE SAMPLED: May 18, 1990      STATION: MW 1  
SAMPLER: P. Schuyler      TIME SAMPLED: 12:30

<u>Parameter</u>	<u>Concentration (ug/L)</u> <sup>1</sup>
Benzene	ND <sup>2</sup>
Chlorobenzene	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
Ethylbenzene	ND
Toluene	ND
Xylenes	ND
MTBE	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 1

NOTES:

- 1 Method 602 detection limit is 1 ug/L
- 2 None detected

Reviewed by Suzanne M. Hendricks



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LABORATORY REPORT

EPA METHOD 602 -- PURGEABLE AROMATICS

CLIENT: Griffin International  
PROJECT NAME: Specialty Paperboard  
REPORT DATE: May 31, 1990      DATE RECEIVED: May 21, 1990  
ANALYSIS DATE: May 30, 1990      REF.#: 12,160  
DATE SAMPLED: May 18, 1990      STATION: MW 2  
SAMPLER: P. Schuyler      TIME SAMPLED: 11:15

<u>Parameter</u>	<u>Concentration (ug/L)</u> <sup>1</sup>
Benzene	ND <sup>2</sup>
Chlorobenzene	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
Ethylbenzene	ND
Toluene	ND
Xylenes	ND
MTBE	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 1

NOTES:

- 1 Method 602 detection limit is 1 ug/L
- 2 None detected

Reviewed by Suzanne M. Grenville



**ENDYNE, INC.**

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LABORATORY REPORT

EPA METHOD 602 -- PURGEABLE AROMATICS

CLIENT: Griffin International  
PROJECT NAME: Specialty Paperboard  
REPORT DATE: May 31, 1990      DATE RECEIVED: May 21, 1990  
ANALYSIS DATE: May 30, 1990      REF.#: 12,162  
DATE SAMPLED: May 18, 1990      STATION: MW 3  
SAMPLER: P. Schuyler      TIME SAMPLED: 12:45

<u>Parameter</u>	<u>Concentration (ug/L)</u> <sup>1</sup>
Benzene	69.3
Chlorobenzene	ND <sup>2</sup>
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
Ethylbenzene	25.5
Toluene	184.
Xylenes	91.9
MTBE	16.3

NUMBER OF UNIDENTIFIED PEAKS FOUND: 5

NOTES:

- 1 Method 602 detection limit is 1 ug/L
- 2 None detected

Reviewed by Suzanne M. Hendake



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LABORATORY REPORT

EPA METHOD 602 -- PURGEABLE AROMATICS

CLIENT: Griffin International  
PROJECT NAME: Specialty Paperboard  
REPORT DATE: May 31, 1990      DATE RECEIVED: May 21, 1990  
ANALYSIS DATE: May 30, 1990      REF.#: 12,159  
DATE SAMPLED: May 18, 1990      STATION: MW 4  
SAMPLER: P. Schuyler      TIME SAMPLED: 11:05

<u>Parameter</u>	<u>Concentration (ug/L)</u> <sup>1</sup>
Benzene	ND <sup>2</sup>
Chlorobenzene	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
Ethylbenzene	ND
Toluene	1.78
Xylenes	ND
MTBE	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 1

NOTES:

- 1 Method 602 detection limit is 1 ug/L
- 2 None detected

Reviewed by Suzanne M Gundlach



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LABORATORY REPORT

EPA METHOD 602 -- PURGEABLE AROMATICS

CLIENT: Griffin International  
PROJECT NAME: Specialty Paperboard  
REPORT DATE: May 31, 1990      DATE RECEIVED: May 21, 1990  
ANALYSIS DATE: May 30, 1990      REF.#: 12,163  
DATE SAMPLED: May 18, 1990      STATION: Blank  
SAMPLER: P. Schuyler      TIME SAMPLED: 12:50

<u>Parameter</u>	<u>Concentration (ug/L)</u> <sup>1</sup>
Benzene	ND <sup>2</sup>
Chlorobenzene	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
Ethylbenzene	ND
Toluene	ND
Xylenes	ND
MTBE	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:

- 1 Method 602 detection limit is 1 ug/L
- 2 None detected

Reviewed by Suzanne M. Grenier



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LABORATORY REPORT

TOTAL HYDROCARBONS - EPA METHOD 418.1

CLIENT: Griffin International  
REPORT DATE: July 11, 1990  
PROJECT NAME: Specialty Paperboard  
DATE SAMPLED: June 25, 1990  
DATE RECEIVED: June 26, 1990  
DATE ANALYZED: July 9, 1990  
SAMPLER: Peter Murray

Reference number:

Concentration (mg/L)<sup>1</sup>

12,990	<0.8
12,992	<0.8
12,994	<0.8
12,996	<0.8
12,998	<0.8
13,000	61.
13,002	<0.8
13,004	<0.8

Sample ID:

12,990: MW 4; 10:50 a.m.  
12,992: MW 2; 11:00 a.m.  
12,994: MW 1; 11:15 a.m.  
12,996: MW 5; 2:00 p.m.  
12,998: MW 6; 2:40 p.m.  
13,000: MW 7; 3:00 p.m.  
13,002: Supply Well; 3:40 p.m.  
13,004: Site Blank

Notes:

1 Method detection limit is 0.8 ppm

Reviewed by Suzanne M. Greenlake





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LABORATORY REPORT  
EPA METHOD 601 -- PURGEABLE HALOCARBONS

CLIENT: Griffin International  
PROJECT NAME: Specialty Paperboard  
DATE: July 9, 1990 ANALYSIS DATE: July 6, 1990  
SAMPLER: Peter Murray STATION: MW 1  
DATE SAMPLED: June 25, 1990 REF.#: 12,993  
DATE RECEIVED: June 26, 1990 TIME SAMPLED: 11:15 a.m.

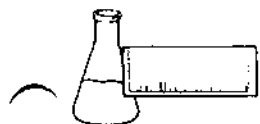
<u>Parameter</u>	<u>Concentration (ug/L)</u> <sup>1</sup>
Bromodichloromethane	ND <sup>2</sup>
Bromoform	ND
Bromomethane	ND
Carbon tetrachloride	ND
Chlorobenzene	ND
Chloroethane	ND
2-Chloroethylvinyl ether	ND
Chloroform	ND
Chloromethane	ND
Dibromochloromethane	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
Dichlorodifluoromethane	ND
1,1-Dichloroethane	ND
1,2-Dichloroethane	ND
1,1-Dichloroethene	ND
trans-1,2-Dichloroethene	ND
1,2-Dichloropropane	ND
cis-1,3-Dichloropropene	ND
trans-1,3-Dichloropropene	ND
Methylene Chloride	PLE <sup>3</sup>
1,1,2,2-Tetrachloroethane	ND
Tetrachloroethene	11.6
1,1,1-Trichloroethane	13.8
1,1,2-Trichloroethane	ND
Trichloroethene	ND
Trichlorofluoromethane	14.5
Vinyl Chloride	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:

- 1 Method 601 detection limit is 1 ug/L
- 2 None detected
- 3 Present in background laboratory environment

Reviewed by: Suzanne M. Kendall



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LABORATORY REPORT  
EPA METHOD 601 -- PURGEABLE HALOCARBONS

CLIENT: Griffin International  
PROJECT NAME: Specialty Paperboard  
DATE: July 9, 1990 ANALYSIS DATE: July 6, 1990  
SAMPLER: Peter Murray STATION: MW 2  
DATE SAMPLED: June 25, 1990 REF.#: 12,991  
DATE RECEIVED: June 26, 1990 TIME SAMPLED: 11:00 a.m.

<u>Parameter</u>	<u>Concentration (ug/L)</u> <sup>1</sup>
Bromodichloromethane	ND <sup>2</sup>
Bromoform	ND
Bromomethane	ND
Carbon tetrachloride	ND
Chlorobenzene	ND
Chloroethane	ND
2-Chloroethylvinyl ether	ND
Chloroform	ND
Chloromethane	ND
Dibromochloromethane	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
Dichlorodifluoromethane	ND
1,1-Dichloroethane	ND
1,2-Dichloroethane	ND
1,1-Dichloroethene	ND
trans-1,2-Dichloroethene	ND
1,2-Dichloropropane	ND
cis-1,3-Dichloropropene	ND
trans-1,3-Dichloropropene	ND
Methylene Chloride	PLE <sup>3</sup>
1,1,2,2-Tetrachloroethane	ND
Tetrachloroethene	17.2
1,1,1-Trichloroethane	16.9
1,1,2-Trichloroethane	ND
Trichloroethene	ND
Trichlorofluoromethane	12.2
Vinyl Chloride	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:

- 1 Method 601 detection limit is 1 ug/L
- 2 None detected
- 3 Present in background laboratory environment

Reviewed by: Suzanne M. Marshall



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LABORATORY REPORT  
EPA METHOD 601 -- PURGEABLE HALOCARBONS

CLIENT: Griffin International  
PROJECT NAME: Specialty Paperboard  
DATE: July 9, 1990 ANALYSIS DATE: July 6, 1990  
SAMPLER: Peter Murray STATION: MW 4  
DATE SAMPLED: June 25, 1990 REF.#: 12,989  
DATE RECEIVED: June 26, 1990 TIME SAMPLED: 10:50 a.m.

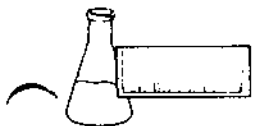
<u>Parameter</u>	<u>Concentration (ug/L)<sup>1</sup></u>
Bromodichloromethane	ND <sup>2</sup>
Bromoform	ND
Bromomethane	ND
Carbon tetrachloride	ND
Chlorobenzene	ND
Chloroethane	ND
2-Chloroethylvinyl ether	ND
Chloroform	ND
Chloromethane	ND
Dibromochloromethane	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
Dichlorodifluoromethane	ND
1,1-Dichloroethane	ND
1,2-Dichloroethane	ND
1,1-Dichloroethene	ND
trans-1,2-Dichloroethene	ND
1,2-Dichloropropane	ND
cis-1,3-Dichloropropene	ND
trans-1,3-Dichloropropene	ND
Methylene Chloride	PLE <sup>3</sup>
1,1,2,2-Tetrachloroethane	ND
Tetrachloroethene	6.98
1,1,1-Trichloroethane	5.48
1,1,2-Trichloroethane	ND
Trichloroethene	ND
Trichlorofluoromethane	1.62
Vinyl Chloride	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:

- 1 Method 601 detection limit is 1 ug/L
- 2 None detected
- 3 Present in background laboratory environment

Reviewed by: Suzanne M. Hendrick



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LABORATORY REPORT  
EPA METHOD 601 -- PURGEABLE HALOCARBONS

CLIENT: Griffin International  
PROJECT NAME: Specialty Paperboard  
DATE: July 9, 1990 ANALYSIS DATE: July 6, 1990  
SAMPLER: Peter Murray STATION: MW 5  
DATE SAMPLED: June 25, 1990 REF.#: 12,995  
DATE RECEIVED: June 26, 1990 TIME SAMPLED: 2:00 p.m.

<u>Parameter</u>	<u>Concentration (ug/L)</u> <sup>1</sup>
Bromodichloromethane	ND <sup>2</sup>
Bromoform	ND
Bromomethane	ND
Carbon tetrachloride	ND
Chlorobenzene	ND
Chloroethane	ND
2-Chloroethylvinyl ether	ND
Chloroform	ND
Chloromethane	ND
Dibromochloromethane	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
Dichlorodifluoromethane	ND
1,1-Dichloroethane	ND
1,2-Dichloroethane	ND
1,1-Dichloroethene	ND
trans-1,2-Dichloroethene	ND
1,2-Dichloropropane	ND
cis-1,3-Dichloropropene	ND
trans-1,3-Dichloropropene	ND
Methylene Chloride	PLE <sup>3</sup>
1,1,2,2-Tetrachloroethane	ND
Tetrachloroethene	ND
1,1,1-Trichloroethane	ND
1,1,2-Trichloroethane	ND
Trichloroethene	ND
Trichlorofluoromethane	ND
Vinyl Chloride	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:

- 1 Method 601 detection limit is 1 ug/L
- 2 None detected
- 3 Present in background laboratory environment

Reviewed by: Suzanne M. Brenden



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LABORATORY REPORT  
EPA METHOD 601 -- PURGEABLE HALOCARBONS

CLIENT: Griffin International  
PROJECT NAME: Specialty Paperboard  
DATE: July 9, 1990 ANALYSIS DATE: July 6, 1990  
SAMPLER: Peter Murray STATION: MW 6  
DATE SAMPLED: June 25, 1990 REF.#: 12,997  
DATE RECEIVED: June 26, 1990 TIME SAMPLED: 2:40 p.m.

<u>Parameter</u>	<u>Concentration (ug/L)<sup>1</sup></u>
Bromodichloromethane	ND <sup>2</sup>
Bromoform	ND
Bromomethane	ND
Carbon tetrachloride	ND
Chlorobenzene	ND
Chloroethane	ND
2-Chloroethylvinyl ether	ND
Chloroform	ND
Chloromethane	ND
Dibromochloromethane	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
Dichlorodifluoromethane	ND
1,1-Dichloroethane	56.9
1,2-Dichloroethane	2.63
1,1-Dichloroethene	ND
trans-1,2-Dichloroethene	71.9
1,2-Dichloropropane	1.07
cis-1,3-Dichloropropene	ND
trans-1,3-Dichloropropene	ND
Methylene Chloride	3.99
1,1,2,2-Tetrachloroethane	ND
Tetrachloroethene	21.1
1,1,1-Trichloroethane	4.96
1,1,2-Trichloroethane	ND
Trichloroethene	6.30
Trichlorofluoromethane	ND
Vinyl Chloride	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 3

NOTES:

- 1 Method 601 detection limit is 1 ug/L
- 2 None detected

Reviewed by: Suzanne M. Brendtche



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LABORATORY REPORT  
EPA METHOD 601 -- PURGEABLE HALOCARBONS

CLIENT: Griffin International  
PROJECT NAME: Specialty Paperboard  
DATE: July 9, 1990 ANALYSIS DATE: July 6, 1990  
SAMPLER: Peter Murray STATION: MW 7  
DATE SAMPLED: June 25, 1990 REF.#: 12,999  
DATE RECEIVED: June 26, 1990 TIME SAMPLED: 3:00 p.m.

<u>Parameter</u>	<u>Concentration (ug/L)</u> <sup>1</sup>
Bromodichloromethane	ND <sup>2</sup>
Bromoform	ND
Bromomethane	ND
Carbon tetrachloride	ND
Chlorobenzene	ND
Chloroethane	ND
2-Chloroethylvinyl ether	ND
Chloroform	ND
Chloromethane	ND
Dibromochloromethane	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
Dichlorodifluoromethane	ND
1,1-Dichloroethane	1.37
1,2-Dichloroethane	ND
1,1-Dichloroethene	ND
trans-1,2-Dichloroethene	ND
1,2-Dichloropropane	ND
cis-1,3-Dichloropropene	ND
trans-1,3-Dichloropropene	ND
Methylene Chloride	PLE <sup>3</sup>
1,1,2,2-Tetrachloroethane	ND
Tetrachloroethene	ND
1,1,1-Trichloroethane	ND
1,1,2-Trichloroethane	ND
Trichloroethene	ND
Trichlorofluoromethane	ND
Vinyl Chloride	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:

- 1 Method 601 detection limit is 1 ug/L
- 2 None detected
- 3 Present in background laboratory environment

Reviewed by: Suzanne M. Franke



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LABORATORY REPORT  
EPA METHOD 601 -- PURGEABLE HALOCARBONS

CLIENT: Griffin International  
PROJECT NAME: Specialty Paperboard  
DATE: July 9, 1990 ANALYSIS DATE: July 6, 1990  
SAMPLER: Peter Murray STATION: Supply Well  
DATE SAMPLED: June 25, 1990 REF.#: 13,001  
DATE RECEIVED: June 26, 1990 TIME SAMPLED: 3:40 p.m.

<u>Parameter</u>	<u>Concentration (ug/L)</u> <sup>1</sup>
Bromodichloromethane	ND <sup>2</sup>
Bromoform	ND
Bromomethane	ND
Carbon tetrachloride	ND
Chlorobenzene	ND
Chloroethane	ND
2-Chloroethylvinyl ether	ND
Chloroform	ND
Chloromethane	ND
Dibromochloromethane	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
Dichlorodifluoromethane	ND
1,1-Dichloroethane	ND
1,2-Dichloroethane	ND
1,1-Dichloroethene	ND
trans-1,2-Dichloroethene	ND
1,2-Dichloropropane	ND
cis-1,3-Dichloropropene	ND
trans-1,3-Dichloropropene	ND
Methylene Chloride	PLE <sup>3</sup>
1,1,2,2-Tetrachloroethane	ND
Tetrachloroethene	ND
1,1,1-Trichloroethane	ND
1,1,2-Trichloroethane	ND
Trichloroethene	ND
Trichlorofluoromethane	ND
Vinyl Chloride	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:

- 1 Method 601 detection limit is 1 ug/L
- 2 None detected
- 3 Present in background laboratory environment

Reviewed by: Suzanne M. Grenache



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LABORATORY REPORT  
EPA METHOD 601 -- PURGEABLE HALOCARBONS

CLIENT: Griffin International  
PROJECT NAME: Specialty Paperboard  
DATE: July 9, 1990 ANALYSIS DATE: July 6, 1990  
SAMPLER: Peter Murray STATION: Site Blank  
DATE SAMPLED: June 25, 1990 REF.#: 13,003  
DATE RECEIVED: June 26, 1990 TIME SAMPLED: NI<sup>4</sup>

<u>Parameter</u>	<u>Concentration (ug/L)</u> <sup>1</sup>
Bromodichloromethane	ND <sup>2</sup>
Bromoform	ND
Bromomethane	ND
Carbon tetrachloride	ND
Chlorobenzene	ND
Chloroethane	ND
2-Chloroethylvinyl ether	ND
Chloroform	ND
Chloromethane	ND
Dibromochloromethane	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
Dichlorodifluoromethane	ND
1,1-Dichloroethane	ND
1,2-Dichloroethane	ND
1,1-Dichloroethene	ND
trans-1,2-Dichloroethene	ND
1,2-Dichloropropane	ND
cis-1,3-Dichloropropene	ND
trans-1,3-Dichloropropene	ND
Methylene Chloride	PLE <sup>3</sup>
1,1,2,2-Tetrachloroethane	ND
Tetrachloroethene	ND
1,1,1-Trichloroethane	ND
1,1,2-Trichloroethane	ND
Trichloroethene	ND
Trichlorofluoromethane	ND
Vinyl Chloride	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:

- 1 Method 601 detection limit is 1 ug/L
- 2 None detected
- 3 Present in background laboratory environment
- 4 Not indicated by sampler

Reviewed by: Suzanne M. Hancock





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LABORATORY REPORT

EPA METHOD 602 -- PURGEABLE AROMATICS

CLIENT: Griffin International  
PROJECT NAME: Specialty Paperboard  
REPORT DATE: July 9, 1990      DATE RECEIVED: June 26, 1990  
ANALYSIS DATE: July 6, 1990      REF.#: 12,993  
DATE SAMPLED: June 25, 1990      STATION: MW 1  
SAMPLER: Peter Murray      TIME SAMPLED: 11:15 a.m.

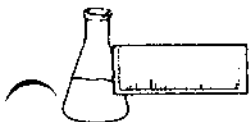
<u>Parameter</u>	<u>Concentration (ug/L)</u> <sup>1</sup>
Benzene	ND <sup>2</sup>
Chlorobenzene	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
Ethylbenzene	ND
Toluene	ND
Xylenes	ND
MTBE	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:

- 1 Method 602 detection limit is 1 ug/L
- 2 None detected

Reviewed by Suzanne M. Grenoble



**ENDYNE, INC.**

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LABORATORY REPORT

EPA METHOD 602 -- PURGEABLE AROMATICS

CLIENT: Griffin International  
PROJECT NAME: Specialty Paperboard  
REPORT DATE: July 9, 1990      DATE RECEIVED: June 26, 1990  
ANALYSIS DATE: July 6, 1990      REF.#: 12,991  
DATE SAMPLED: June 25, 1990      STATION: MW 2  
SAMPLER: Peter Murray      TIME SAMPLED: 11:00 a.m.

<u>Parameter</u>	<u>Concentration (ug/L)</u> <sup>1</sup>
Benzene	ND <sup>2</sup>
Chlorobenzene	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
Ethylbenzene	ND
Toluene	ND
Xylenes	ND
MTBE	ND

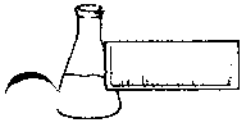
NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:

- 1 Method 602 detection limit is 1 ug/L
- 2 None detected

Reviewed by

*Suzanne M. Hendon*



**ENDYNE, INC.**

Laboratory Services

32 James Brown Drive  
Williston, Vermont 05495  
(802) 879-4333  
FAX 879-7103

LABORATORY REPORT

EPA METHOD 602 -- PURGEABLE AROMATICS

CLIENT: Griffin International  
PROJECT NAME: Specialty Paperboard  
REPORT DATE: July 9, 1990      DATE RECEIVED: June 26, 1990  
ANALYSIS DATE: July 6, 1990      REF.#: 12,989  
DATE SAMPLED: June 25, 1990      STATION: MW 4  
SAMPLER: Peter Murray      TIME SAMPLED: 10:50 p.m.

<u>Parameter</u>	<u>Concentration (ug/L)<sup>1</sup></u>
Benzene	ND <sup>2</sup>
Chlorobenzene	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
Ethylbenzene	ND
Toluene	ND
Xylenes	ND
MTBE	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:

- 1 Method 602 detection limit is 1 ug/L
- 2 None detected

Reviewed by Suzanne M. Stoddard



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LABORATORY REPORT

EPA METHOD 602 -- PURGEABLE AROMATICS

CLIENT: Griffin International  
PROJECT NAME: Specialty Paperboard  
REPORT DATE: July 9, 1990      DATE RECEIVED: June 26, 1990  
ANALYSIS DATE: July 6, 1990      REF.#: 12,995  
DATE SAMPLED: June 25, 1990      STATION: MW 5  
SAMPLER: Peter Murray      TIME SAMPLED: 2:00 p.m.

<u>Parameter</u>	<u>Concentration (ug/L)</u> <sup>1</sup>
Benzene	ND <sup>2</sup>
Chlorobenzene	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
Ethylbenzene	ND
Toluene	ND
Xylenes	ND
MTBE	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 1

NOTES:

- 1 Method 602 detection limit is 1 ug/L
- 2 None detected

Reviewed by Suzanne M. Hendahl



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LABORATORY REPORT

EPA METHOD 602 -- PURGEABLE AROMATICS

CLIENT: Griffin International  
PROJECT NAME: Specialty Paperboard  
REPORT DATE: July 9, 1990      DATE RECEIVED: June 26, 1990  
ANALYSIS DATE: July 6, 1990      REF.#: 12,997  
DATE SAMPLED: June 25, 1990      STATION: MW 6  
SAMPLER: Peter Murray      TIME SAMPLED: 2:40 p.m.

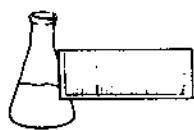
<u>Parameter</u>	<u>Concentration (ug/L)<sup>1</sup></u>
Benzene	11.8
Chlorobenzene	ND <sup>2</sup>
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
Ethylbenzene	ND
Toluene	1.84
Xylenes	ND
MTBE	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 2

NOTES:

- 1 Method 602 detection limit is 1 ug/L
- 2 None detected

Reviewed by Suzanne M. Hersh



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LABORATORY REPORT

EPA METHOD 602 -- PURGEABLE AROMATICS

CLIENT: Griffin International  
PROJECT NAME: Specialty Paperboard  
REPORT DATE: July 9, 1990      DATE RECEIVED: June 26, 1990  
ANALYSIS DATE: July 6, 1990      REF.#: 12,999  
DATE SAMPLED: June 25, 1990      STATION: MW 7  
SAMPLER: Peter Murray      TIME SAMPLED: 3:00 p.m.

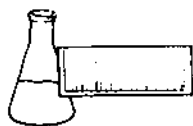
<u>Parameter</u>	<u>Concentration (ug/L)</u> <sup>1</sup>
Benzene	ND <sup>2</sup>
Chlorobenzene	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
Ethylbenzene	ND
Toluene	ND
Xylenes	ND
MTBE	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 2

NOTES:

- 1 Method 602 detection limit is 1 ug/L
- 2 None detected

Reviewed by Suzanne M. Hendall



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LABORATORY REPORT

EPA METHOD 602 -- PURGEABLE AROMATICS

CLIENT: Griffin International  
PROJECT NAME: Specialty Paperboard  
REPORT DATE: July 9, 1990      DATE RECEIVED: June 26, 1990  
ANALYSIS DATE: July 6, 1990      REF.#: 13,001  
DATE SAMPLED: June 25, 1990      STATION: Supply Well  
SAMPLER: Peter Murray      TIME SAMPLED: 3:40 p.m.

<u>Parameter</u>	<u>Concentration (ug/L)</u> <sup>1</sup>
Benzene	ND <sup>2</sup>
Chlorobenzene	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
Ethylbenzene	ND
Toluene	ND
Xylenes	ND
MTBE	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:

- 1 Method 602 detection limit is 1 ug/L
- 2 None detected

Reviewed by

Suzanne M. Hendon



**ENDYNE, INC.**

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LABORATORY REPORT

EPA METHOD 602 -- PURGEABLE AROMATICS

CLIENT: Griffin International  
PROJECT NAME: Specialty Paperboard  
REPORT DATE: July 9, 1990      DATE RECEIVED: June 26, 1990  
ANALYSIS DATE: July 6, 1990      REF.#: 13,003  
DATE SAMPLED: June 25, 1990      STATION: Site Blank  
SAMPLER: Peter Murray      TIME SAMPLED: NI<sup>3</sup>

<u>Parameter</u>	<u>Concentration (ug/L)</u> <sup>1</sup>
Benzene	ND <sup>2</sup>
Chlorobenzene	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
Ethylbenzene	ND
Toluene	ND
Xylenes	ND
MTBE	ND

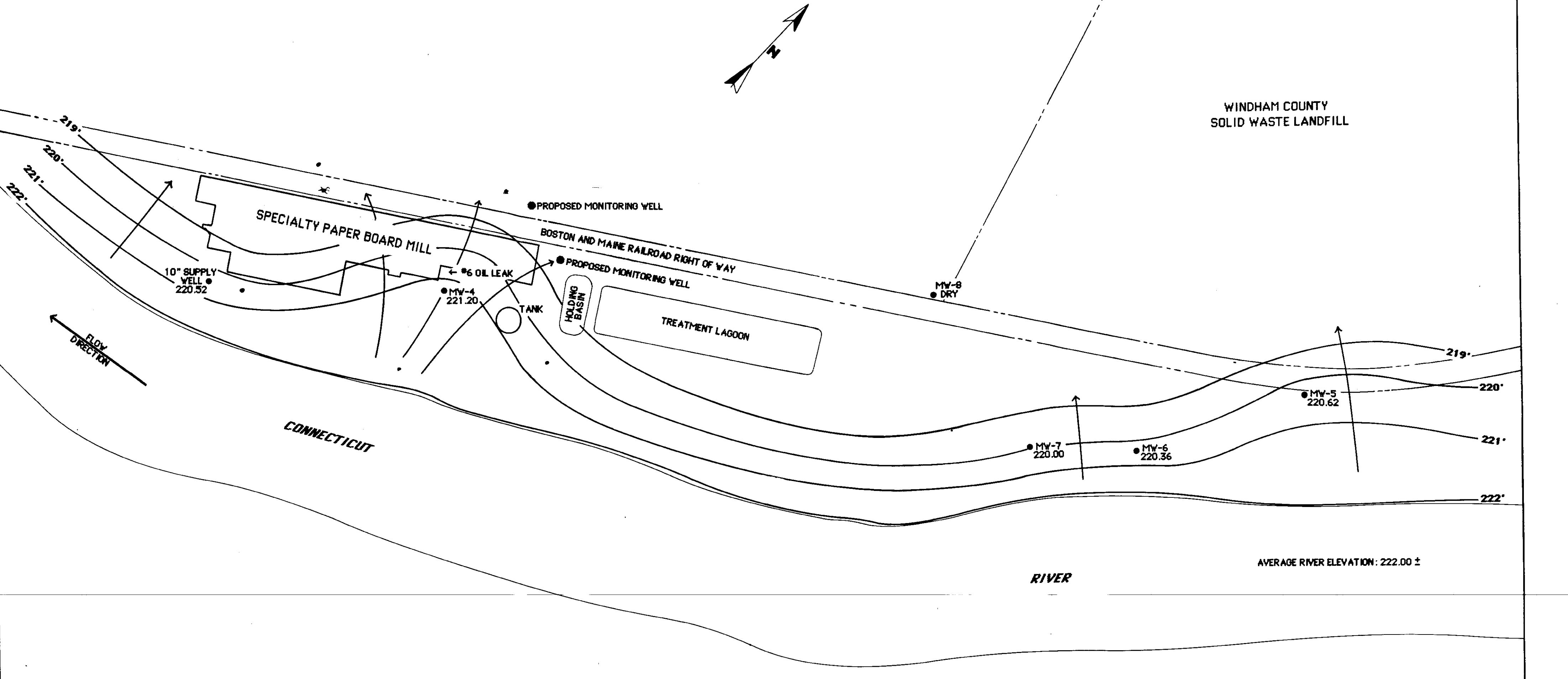
NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:

- 1 Method 602 detection limit is 1 ug/L
- 2 None detected
- 3 Not indicated by sampler

Reviewed by Suzanne M. Hrenouk





**LEGEND**

- MONITORING WELL
- 219' — 219' GROUNDWATER CONTOUR
- GROUNDWATER FLOW DIRECTION
- GROUNDWATER CONTOUR INTERVALS IN FEET
- MONITORING WELL IDENTIFICATION:  
MW-4 - WELL I.D.  
221.20 - WATER TABLE ELEVATION IN FEET ABOVE SEA LEVEL

**SITE MAP**  
**SPECIALTY PAPERBOARD MILL AND ENVIRONS**  
**BRATTLEBORO, VERMONT**

PROJECT: SPECIALTY PAPERBOARD  
LOCATION: BRATTLEBORO, VERMONT  
GRIFFIN INTERNATIONAL PROJECT NO.: 690416  
MAP SOURCE: C.T. MALE ASSOCIATES,  
BRATTLEBORO, VERMONT  
GROUNDWATER ELEVATION MONITORING DATE: 6/25/90  
SCALE: 1" = 200'

